VOLUME II JUNE, 1909 NUMBER 6

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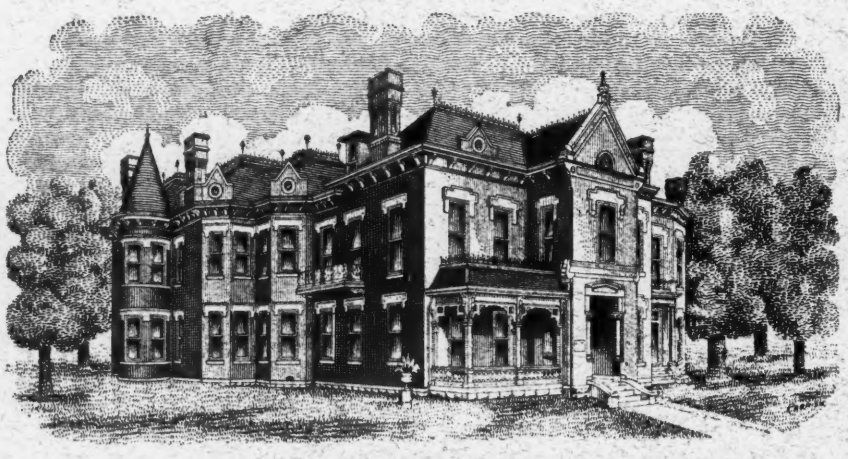

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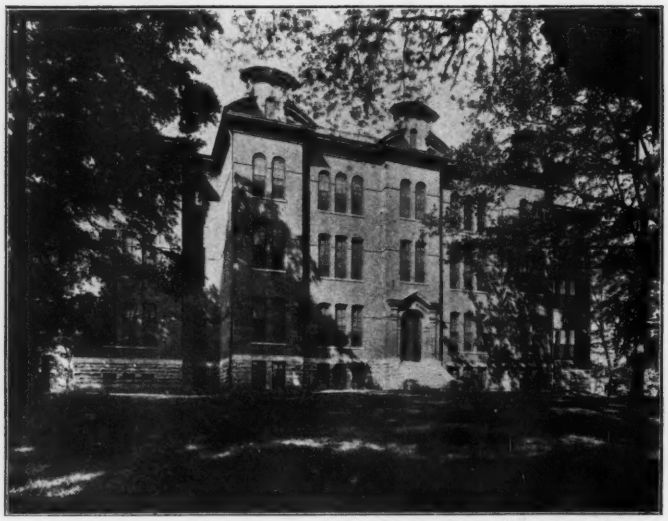

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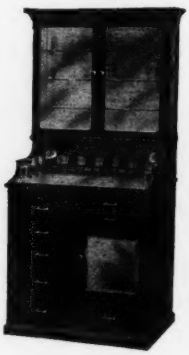

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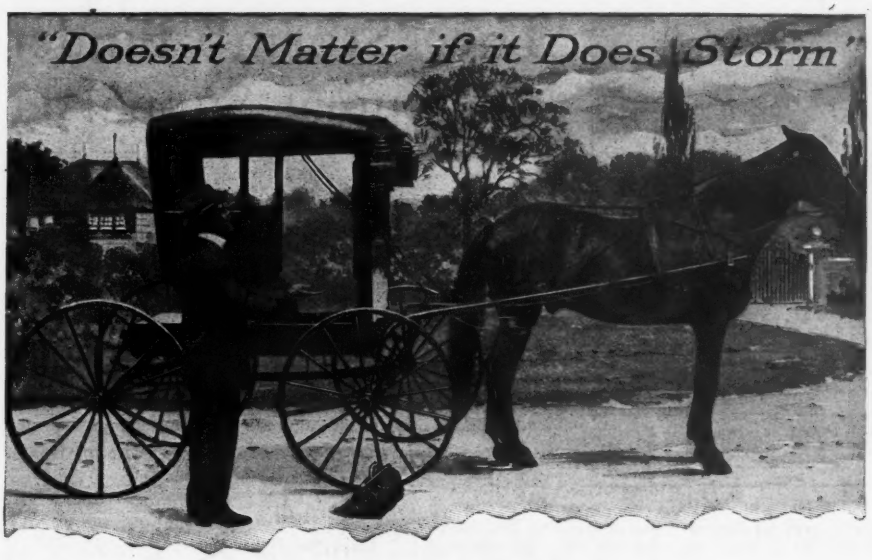

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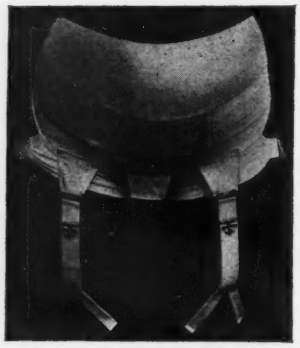

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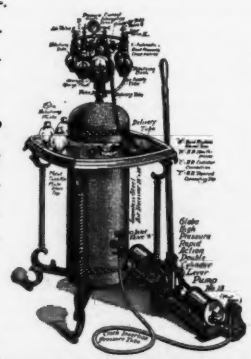

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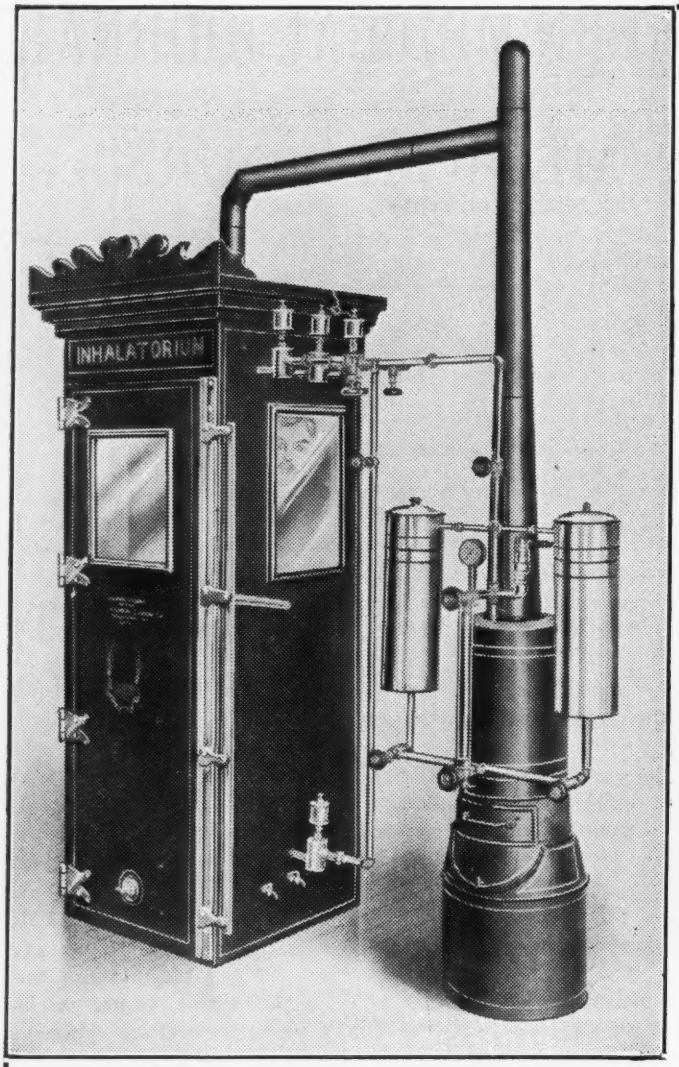

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DISEASES OF THE COLON DUE TO EXTRA-INTESTINAL CAUSES, WITH SPECIAL REFERENCE TO MEMBRANOUS COLITIS.—ILLUSTRATIVE CASES.*

A. B. COOKE, M.D., NASHVILLE, TENN.

The intimate functional relations existing between the several viscera of digestion constitute such an elementary part of our everyday working knowledge that it would be a waste of time to enter into their discussion before this body. But it has been impressed upon me, with increasing observation and experience, that the anatomic relations of the alimentary tube and the frequency with which they are to be looked to for explanation of many of its pathologic conditions, have not received the serious consideration their importance demands. In this paper I shall deal briefly with this particular phase of the subject, calling attention to certain familiar diseases of the colon which are often found to exist primarily because of these relations and the mechanical irritation growing out of them.

Perhaps the most conspicuous example of colonic diseases belonging to this class is *membranous colitis.* Much confusion and a wide divergence of opinion have always prevailed as to the true nature and pathology of this malady. Without entering into a discussion of these mooted questions at this time, it may be said that the conflict of view is probably due to lack of agreement as to what constitutes the disease. The terms mucous colitis, colica mucosa, membranous colitis and mucomembranous colitis are used indiscriminately as the names of a disease characterized by the discharge of excessive quantities of mucus from the bowel, whereas such a discharge is in reality nothing more than a symptom. The truth is that practically all types of chronic inflammation of the large bowel present this symptom in greater or less degree, though the etiology of one case may be widely different from that of another. The conclusions of such authorities as Hemmeter, Osler, Tyson and other eminent internists that the disease is a secretion neurosis, and that it may and does exist without recognizable pathology in the gut itself or in any other viscus, can not be lightly set aside. It is certain, however, that with rare exceptions this view is not supported by equally careful and competent clinicians who have approached the study of the subject by more direct and exact methods of investigation. Personally I have never seen a case of chronic colitis of any type in which I failed to find unmistakable evi-

*Read before the American Proctologic Society, Atlantic City, N. J., June 8, 1909.

dences of pathology in the mucosa, though I have seen cases in which it was impossible to demonstrate the presence of pathologic conditions of other viscera.

For present purposes the term membranous colitis is limited to that peculiar affection which is characterized by the periodic discharge of mucus with membranes or casts from the bowel and of which fecal stasis is always a prominent feature. With reference to this type of colitis I am prepared to state unequivocally that I have never seen a case in which I failed to find some gross pathologic condition of one or more abdominal organs as well as of the mucosa itself; and furthermore that the etiologic relation between the two has been clearly established in a number of cases by the prompt and permanent disappearance of the bowel trouble upon correction of the extra-intestinal condition, after all other methods of treatment had failed. From this experience I have been led to conclude that the primary causes of this particular variety of colitis belong in the main, if not exclusively, to a special class, viz., those which act mechanically. Most noteworthy in the list of such causes are enteroptosis, right movable kidney, peritoneal adhesions and extra-intestinal growths which occasion continuous pressure upon some portion of the colon.

Enteroptosis.—While the advocates of the neurosis theory admit that membranous colitis is often found in association with enteroptosis, as a class they refuse to concede any causative relation between the two. On the other hand they maintain that both are merely incidental expressions of the underlying neurotic condition. In the light of clinical observation, this view seems to me untenable. If it were correct, we should be warranted in expecting to find the colonic affection in a certain proportion of neurotic subjects independent of any visceral ptosis. The facts are to the contrary. Most pronounced cases of hysteria, neurasthenia, etc., often exist without either enteroptosis or membranous colitis. Likewise enteroptosis may exist without either membranous colitis or neurotic manifestations. But membranous colitis in the absence of other organic abdominal pathology to account for it, is so invariably found associated with enteroptosis that a definite causative relationship can not reasonably be denied. It is true that marked neurotic disturbances are practically always present in cases of membranous colitis; but, with the facts above set forth in mind, I believe the conclusion is a sound one that they may properly be regarded as the effect rather than the cause of the latter.

The final and strongest argument in support of the claim that enteroptosis is a frequent cause of membranous colitis is to be found by contrasting the results of treatment. Those who undertake the management of these cases by directing their attention primarily to the accompanying neurotic phenomena have little else than failure to report, and with one accord emphasize the intractable nature of the malady; while those who accept the mechanical origin and local character of the trouble, and direct their treatment accordingly, are able to afford relief in a large proportion of cases.

The following case well illustrates the foregoing points and conclusions:

Mrs. J. P. T., aged 60, came to me from Lincoln County, Tenn., in the fall of 1907, for treatment for membranous colitis. She was the wife of a farmer and the mother of a number of children. Her illness began some fifteen years ago, when she consulted Dr. Battey, of Rome, Ga., who performed a double ovariotomy. She obtained no permanent relief, and for several years was under more or less constant treatment at the hands of her local physicians. About six years ago she consulted a Nashville surgeon, who made a ventral fixation of the uterus and removed her appendix. Returning home her trouble recurred in as bad form as before, as soon as she resumed her accustomed duties. The

patient was a tall, angular, poorly nourished woman, presenting exaggerated neurotic symptoms. She gave an unusually intelligent history of her illness, emphasizing the digestive disturbance, and the periodic attacks of abdominal pain, accompanied by the discharge of membranes and mucus, from which she had suffered from the beginning.

Abdominal examination revealed a marked ptosis both of the stomach and intestines, with tenderness on pressure over the whole course of the colon. There was no looseness of the kidneys, and no evidence of peritoneal adhesions or other abnormal condition. Pelvic examination was negative. Proctoscopic examination showed the usual appearances of hypertrophic inflammation of the rectum and sigmoid.

The treatment was rest in bed, together with laxatives, regulation of the diet, general massage and daily colonic irrigations. Before allowing her to sit up a snug-fitting abdominal supporter was applied, and the patient instructed to wear it constantly except when in bed. She improved rapidly. The abdominal distress and mucous discharges soon ceased, and *the nervous symptoms vanished with them.* Twice since at intervals of five or six months the patient has returned to me in much the same condition as when I first saw her, the recurrence of her trouble being due, as she herself recognized, to leaving off the abdominal supporter, and other indiscretions, under the mistaken idea that she was permanently cured. Both times the same line of treatment was adopted with the same happy results.

Two points are of special significance in this case:

First, that the membranous colitis promptly recurs when the enteroptosis is neglected.

Second, that the nervous symptoms are clearly dependent upon the abdomnal pathology.

Movable Kidney.—Normally the upper extremity of the posterior surface of the ascending colon is in direct contact with the anterior surface of the right kidney. When from any cause the kidney becomes loosened from its bed, the only direction in which it can move is downward, and the same intimate relation is capable of being maintained throughout the whole length of this portion of the colon. It is further to be noted that in the great majority of instances (70 to 80 per cent.), the posterior surface of the ascending colon, like the kidney, is retroperitoneal, being connected directly to the abdominal wall by areolar tissue, and that the pathway of a pathologically mobile kidney lies in immediate relation with this unprotected surface. With these anatomic facts in mind, and remembering that the amount of the kidney's motion is to considerable extent determined by respiratory action, it is not remarkable that the mechanical irritation incident to its oft repeated round trip excursions over the same route should ultimately result in inflammation of the colon.

Practically identical anatomic relations exist between the descending colon and the left kidney, and they are of lesser clinical significance only because of the comparative rarity of left movable kidney. Under similar conditions I am persuaded that the same train of events may be expected to follow as frequently upon one side as upon the other.

The question is sometimes asked: "If movable kidney is capable of causing membranous colitis, why does it not always do so?" A sufficient answer to this question is contained in the simple statement that uniformity is a term which can not be applied to any disease process. As well ask why a retroverted uterus is not always accompanied by backache or irritable bladder. But a more obvious and satisfactory answer is that in some patients with movable kidney the vulnerable portion of the colon may be provided with a mesentery, thus permitting it to escape out of harm's way. This suggestion, original so far as I know, is certainly worthy of consideration.

The following interesting case is probably

unique, in that it demonstrates in one subject an unmistakable etiologic relation between both left and right movable kidney and membranous colitis:

Miss Virginia B., aged 18, a young woman of splendid physique, and previously entirely healthy, in the spring of 1902 was riding in an elevator when the machinery suddenly gave way, precipitating elevator and occupants a distance of three stories to the concrete floor of the basement. She was considerably shocked as an immediate effect, but there were no other symptoms until her next menstrual period, which for the first time in her life was marked by great pain. Gradually abdominal tenderness, attacks of colicky pain, constipation and other symptoms developed, and when she first came into my hands some months after the accident she had become quite nervous. Upon thorough examination the only pathology discoverable was an exaggerated retro-displacement of the uterus and a *left* movable kidney. The right kidney was not movable at this time. Hoping that all her symptoms were attributable to the uterine pathology, the misplacement was corrected under general anesthesia and a pessary adjusted. After several months treatment the pelvic symptoms disappeared, but the abdominal discomfort persisted, and in addition the patient began to suffer from indigestion and painful discharges of mucus from the bowel.

In May 1903 I anchored the left kidney. Recovery from the operation was followed by rapid disappearance of all symptoms, and the patient remained entirely well for some three years. During the summer of 1906 she began again to suffer from attacks of colicky pains, muco-membranous discharges, indigestion and nervousness. Expecting from the similarity of symptoms that the former operation had proved futile, and that the left kidney was again loose, I was greatly surprised to discover that such was not the case. Upon extending the examination I now found that the *right* kidney was movable, descending fully four inches on forced inspiration, and that it was extremely tender on manipulation. In May, 1907, I performed nephropexy upon this kidney. The results were again prompt and magical. All symptoms, including both the nervousness and the colitis, quickly subsided, and the patient has remained entirely well during the two years which have elapsed since the last operation.

Peritoneal Adhesions.—It is a familiar clinical observation that peritoneal adhesions, the result of inflammatory action, may occur between any of the contiguous viscera of the abdominal and pelvic cavities, or between the viscera and contiguous portions of the abdominal and pelvic walls. Generally speaking, when such adhesions involve the small bowel the symptoms are apt to be acute and intestinal obstruction is the danger to be feared. When the large bowel is implicated, on the other hand, the symptoms, if any, are essentially chronic and usually manifest themselves from the beginning in vague disturbances of digestion, auto-intoxication, constipation, etc., the true cause of which may easily be overlooked. This marked difference in the character of the symptoms produced is entirely comprehensible when the radical differences in the size, length, structure, function and anatomic relations of the small intestine and colon are called to mind.

With reference to the colon, while it is doubtless true that the phenomena due to this cause are in some measure attributable to reflex action, mechanical irritation certainly plays a part. Pathologic fixation of any portion of the colon, even though only partial, is necessarily attended by retardation of peristalsis, with the result that the gut is exposed to increased taumatism from within as well as from without. In this way inflammation of the mucosa is set up, and mucous and membranous colitis, which are merely advanced stages of the inflammatory process, follow. The sites at which this type of pathology is most frequently encountered are the cecal re-

gion, the gall-bladder region, and the sigmoid loop of the colon by extension of the inflammatory process from the pelvic organs. With reference to the first mentioned Tuttle* has recorded twenty-two such cases in which the diagnosis was verified by operation. In my own personal experience a number of similar cases have been observed. To me the chain of evidence is complete when, in a patient presenting mebranous colitis and a chronically inflamed appendix with adhesions, removal of the latter is promptly followed by disappearance of the former together with the accompanying constipation and other symtpoms, after all non-operative methods of treatment have failed. I have not personally observed a case of membranous colitis resulting from adhesions about the gall-bladder, but reasoning from analogy, I am convinced that they may and do occur. Tuttle* reports several such cases.

Chronic inflammation of the colon with hypersecretion of mucous as a result of pelvic adhesions I have seen in a number of instances. A recent interesting case in point is the following:

Mrs. W., aged 42, came to me from Southern Kentucky in March of the present year for operation for internal hemorrhoids. Upon inquiring into the history of her case I ascertained that following the birth of her last child twelve years ago she began to suffer from backache, constipation and protruding piles, and some six or seven years ago had a severe attack of nervous prostration from the effects of which she had never fully recovered. For the past few years, in addition to constipation, she had suffered from attacks of abdominal pain followed by mucous discharges from the bowels. Examination disclosed one of the most exaggerated cases of prolapsing hemorrhoids I have ever seen. Vaginal examination revealed a uterus displaced backward and to the left and immovably fixed in its faulty position. Telling the patient that she needed something more than a hemorrhoid operation, I communicated with her husband by telephone and obtained his authority to do anything necessary. Upon opening the abdomen next morning I found a left broad ligaemnt cyst (parovarian) with adhesions binding it closely to the bowel just above the recto-sigmoid junction. The uterus was pulled backward and held firmly against the upper end of the rectum thus impeding the circulation and accounting for the aggravated hemorrhoidal condition. The cyst together with the left tube and ovary were removed and the hemorrhoids disposed of by a radical operation with the ligature. The patient made an uninterrutped recovery, returning home on the nineteenth day. She writes that her health and strength have been rapidly regained and that she feels like a new woman.

The most important point in connection with this case is the necessity it so well illustrates of subjecting every patient to a thorough examination before undertaking operation or treatment. For obvious reasons, this necessity is especially urgent with respect to female patients, examination of the pelvis and abdomen often proving of far greater value both to patient and physician than examination of the rectum. When the case is one of membranous colitis, which the history usually discloses, I do not hesitate to say that from my point of view it would be no more culpable to undertake the treatment of an obstinate cough without a physical examination of the lungs than to attempt to treat this condition without the preliminary examination of the abdomen and pelvis referred to.

Another possible source of pelvic adhesions is perisigmoiditis. In this type of cases the primary origin of the infection which underlies the inflammatory process is doubtless to be found in the bowel itself; but the chronic colitis to which it ultimately leads seems to be largely dependent upon the adhesions. This is demonstrated by the success which follows surgery directed to the extra-intestinal lesions.

*"Mucous Mucomembranous, and Membrinous Colitis," N. Y. Medical Journal, May 4, 1907.

*Ibid.

Numerous cases of this kind have been recorded in recent years in which both the mucous discharges and the constipation were cured by freeing the adherent bowel and suturning it to the abdominal wall (colopexy).

Extra Intestinal Growths.—The case last recorded might very properly have been reserved to illustrate this class of causes. It is, of course, impossible to say just how much of the bowel trouble in this case was due to the cyst and how much to the adhesions. While the latter were undoubtedly due to the former, the irritation resulting from the continuous pressure of the neoplasm, irrespective of the adhesions, should not be lost sight of as a possible etiologic factor.

Perhaps the most frequent example of this class of causes is to be found in the fibroid uterus. When the tumor is of large size or is so situated as to lie in contact with a certain definite portion of the large bowel, usually the sigmoid, the constant pressure may readily excite inflammatory action with the discharge of mucus and casts. Many such cases have been observed, though, strange to say, the colitis feature has been accorded scant attention in the description of them.

Without further specifying, it may be said that any new growth of the abdomen or pelvis so situated as to keep up continuons mechanical pressure upon a limited area of the colon may result in membranous colitis. The effect is especially apt to follow if sufficient inflammation is excited to produce peritoneal adhesions at the site of the irritation.

Membranous colitis is not the only disease of the colon which may be due to extra intestinal causes. Obstipation and fecal impaction incident to acute flexures or strictures produced by adhesive bands, the invasion of the gut by malignant neoplasms originating in the other viscera, the perforation of the gut by abscesses located in various portions of the abdominal and pelvic cavities, etc., are types of pathology with which we have to become more or less familiar in late years. But the unexpected length this paper has already reached admonishes me to be content with the bare allusion to them.

THE BASTING SUTURE IN GASTRO-ENTEROSTOMY.*

JOHN WESLEY LONG, M.D., GREENSBORO, N. C.

The Purpose.—Gastro-enterostomy has been well-nigh perfected both as to its mechanics and indications. It is not the purpose of the writer to discuss in this paper the indications, but to review briefly the development of its technic and to call attention to a certain device which has proven very helpful in the performance of the operation.

The basting suture to be described is not intended to be used exclusively in gastro-enterostomy, but is equally applicable to any of the anastomotic operations of the alimentary canal. However, it is thought best to describe it as applied to gastro-enterostomy because a study of the history of this operation brings out quite clearly the development of this phase of surgery from its crude beginning to its present refined technic, which is almost above criticism, if we may judge by results.

Evolution of the Operation.—Gastro-enterostomy has undergone many changes since it was first done by Wolfler (1) in 1881. A few, only of the principal ones will be noticed. But the most casual study of the history of the operation will convince us that gastro-enterostomy as we have it today did not spring Minerva-like, full fledged from some great surgeon's brain, but is the result of a gradual growth, with here a little added and there a little, till now it is recognized as one of the most brilliant achievements of modern surgery.

Short Anterior Loop.—In the Wolfler operation the anastomosis is made to the anterior wall (Fig. 1) of the stomach, and all references to the earlier operations are to be understood as applying to the Wolfler anterior method.

The mortality from the first operation in 1881 to 1885 was 65.7 per cent (2). It was, therefore, felt to be imperative that some radical change must be made in the mechanics of the operation in order to establish it upon a secure basis as a sound surgical procedure.

It was clear that the operation had a well-defined field of usefulness, if it could be done with a low mortality.

Selecting the Proper Coil.—The first important advance in the mechanics of the operation consisted in selecting the proper coil of intestine since the earlier operators anastomosed the first coil that presented itself, (2) which sometimes happened to be the distal portion of the ileum.

Selecting a coil at random resulted in making a loop of varying length. When the loop is long that portion of the intestine composing the loop is practically excluded from its share in the function of nutrition. Therefore, it is readily seen that to exclude a considerable length of the small bowel, as is done when the anastomosis is made low down, might, and usually did, cause inanition and often the death of the patient.

Senn (3) has shown that to remove more than one-third of the total length of the bowel causes starvation. Monari (3) asserts that one-half of the small intestine may be removed without seriously interfering with metabolism.

To exclude the bowel by making the anastomosis low down has practically the same effect upon nutrition as if the bowel were resected.

*Read before the Greene County Medical Society, April 14, 1909.

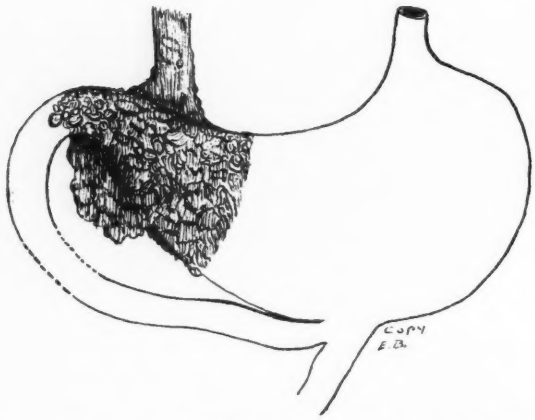


FIG. 1.—Wolfler's Method of Gastro-Enterostomy. (Copied from illustration used in Keen's Cartwright Lecturers—New York Medical Journal, May 21, 1898.)

Recognizing this difficulty, the loop was gradually shortened, until finally it was reduced to 12 to 20 inches, which is as short as the loop can reasonably be made in the anterior operation, since the loop must embrace the tranverse colon.

The Wolfler method, with the short loop, has given many brilliant results, and is used even to this day by some operators as a matter of choice; as, for instance, when employing the McGraw ligature. When dense adhesions are present, preventing access to the posterior wall of the stomach, the operator is forced to utilize the anterior wall.

Posterior Method.—Much as was gained by the short loop anterior method, the operation was often followed by untoward results, chief of which was regurgitant vomiting.

To overcome the difficulties inherent to the anterior method Courvoisier (4) suggested as early as 1883 anastomosing the bowel to the posterior wall of the stomach. It was not till 1885 that von Hacker (5) did the first posterior gastro-enterostomy.

There are two distinct advantages in the posterior method. First, it allows the opening to be made at the lowest part of the stomach. While Cannon and Blake (6) have demonstrated that the lowest point of the stomach is not a fixed point, yet it must be remembered that when the stomach is empty the pylorus is not far from the lowest point, although the organ becomes more nearly horizontal when distended (Mayo.) And unquestionably an opening along the greater curvature, perpendicularly under the cardiac end, will drain the stomach more effectually when placed elsewhere.

The value of drainage in stomach cases is strikingly stated by Doyen (7), who says, "The one phenomenon which dominates the pathology of the stomach is the evacuation of its contents."

The second advantage gained by the von Hacker method, is that it allows the anastomosis to be made with a very short loop, or better, no loop at all.

The No-Loop Method.—A study of the development of the posterior method, as it was first done to the present day method without a loop, is very interesting.

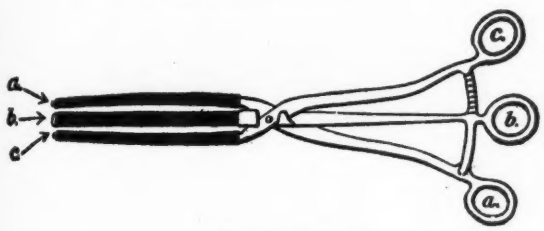
Even the first operations done by the von Hacker method gave better functional results and a slightly lower mortality than had been attained by the anterior operation. According to Keen (2) 231 operations by the Wolfler method gave a mortality of 38.09 per cent,

while 152 operations by the von Hacker method gave a mortality of 35.52 per cent.

Mickulitz, who did much to develop the posterior method, made the incision in the bowel transversely, employing a three or four-inch loop.

Then came the advent of the Murphy button, which has been used with much success in both the posterior and anterior operation. Czerney used it with so much success in the posterior operation that he was loath to adopt the suture method, the button being easy of application and having materially reduced the mortality.

The next important step in the development of the posterior operation was the use of clamps in the suture method. They were first employed by Moynihan, and the operation is called by his name. Mr. Moynihan demonstrated his method in this country in 1903. (6) Two clamps are employed, one to hold the stomach and one the bowel. Roosevelt has recently invented a three-prong clamp, which is more convenient.



ROOSEVELT CLAMPS.

Moynihan at this time was using a 9-inch loop. To Peterson and Czerney is due the credit of introducing the short loop, or no-loop, principle in posterior gastro-enterostomy. (8)

In October, 1903, C. H. Mayo did two posterior gastro-enterostomies, using the suture no-loop method, and making the intestinal incision longitudinally.

Regurgitant Vomiting.—Among the evil results of gastro-enterostomy, as formerly done, was regurgitant vomiting. It was the Banquo's ghost that would not down. After trying ever so hard the surgeon was frequently confronted with pernicious vomiting, often necessitating a second operation; if indeed, the patient's life was spared at all. The high mortality of the earlier operations and the lower mortality of the later operations was due largely to this untoward complication. The writer lost one of his earlier cases some two months after the operation from this cause. In another instance the patient's life was saved, in fact, her health completely restored, by doing a secondary jeju-jejunostomy.

When the vomiting occurs within the first week it is called the "vicious circle" (Ochsner), when it develops later it is called "regurgitant vomiting." However, in their etiology and significance they are essentially the same. In its worst form the oft-repeated emesis of large quantities of stomach and duodenal contents accompanied by dilatation of both stomach and duodenum is prostrating to an extreme degree, frequently destroying life.

Many theories have been advanced to account for the cause of regurgitant vomiting. The theory was promulgated and is still held by some that the vomiting is due to reversing the peristalsis, but the results of the later operations show conclusively that the direction of the peristalsis has nothing whatever to do with the vomiting. Despite the divergence of views on this question, recent work has demonstrated that the vomiting is due to some fault in the mechanics of the operation producing an obstruction at the point of anastomosis.

Many methods have been tried with a view of preventing the vomiting. von Hacker and Doyen narrowed the proximal portion of the bowel; Jaboulay, Braun and others did an entero-enterostomy; while Roux divided the bowel, attaching the distal end to the stomach and the proximal end to the side of the bowel, making a Y-shaped arrangement. Keen, in his

Cartright lectures, goes into this phase of the subject quite fully.

Of all the methods tried none were entirely satisfactory, and it was not till the posterior no-loop operation, with the jejunum applied in its normal relations, thereby preventing the possibility of obstruction, did regurgitant vomiting cease. Moynihan says since adopting this principle regurgitant vomiting has disappeared in his cases. The Mayos give a similar testimony.

The Line of Anastomosis.—The posterior no-loop clamp and suture method having been accepted as the operation of choice, there still remains a much controverted point to be settled; namely, the direction of the line of anastomosis. This question scarcely refers to the direction of the peristalsis, as the controversy concerning that matter is now ancient history; but relates to the relative position of the bowel and stomach with the view of preventing obstruction and consequently bile regurgitation, the ever-present spectre!

The term "Moynihan line" means that the jejunum is attached to the stomach behind in a direction from left to right and slightly downward. Moynihan says with this method that regurgitant vomiting is a thing of the past, and he never sees any vomiting except that due to the anaesthetic, and very rarely that. The "Moynihan line" is beautifully illustrated in *Annals of Surgery,* November, 1905. (Fig. II.)

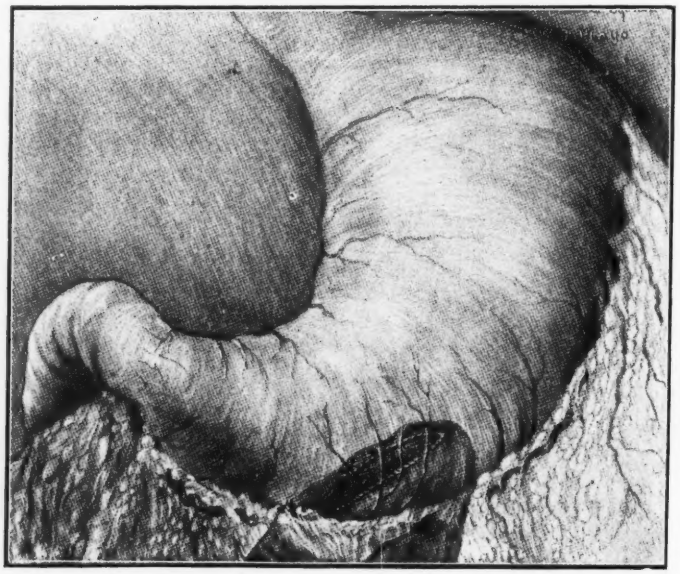


FIG. 2.—Completed operation from in front. Anastomotic opening shows through as darkened area on posterior wall. Note that it goes to the bottom of the gastric cavity and slightly anterior, as indicated by suture line in the omental attachment. Gastro-Enterostomy with the anastomosis made in Moynihan's line. (Illustrations taken from Mayo's article on the Technic of Gastro-Enterostomy, Annals of Surgery, November, 1905.)

In 1906, W. J. Mayo (9) published an important observation that he had noted the year before and frequently demonstrated in his clinic, as the writer can personally testify; to wit, that the first portion of the jejunum normally passes from its beginning at the duodeno-jejunal angle downward and to the left, and for this reason he applies the jejunum to the posterior wall of the stomach in a line

from right to left and slightly downward, (Fig. III) without therefore disturbing its normal relations.

In the January, 1908, issue of the *Annals of Surgery* (10) Mayo, makes the further observation that the occasional occurrence of vomiting following the posterior no-loop operation is due to an abnormally long Trietz ligament (Figs. IV and V.) pulling the jejunum to the right. The presence of this abnormality is deceptive, and causes the surgeon to really make a loop operation when he thinks he is avoiding the loop. Mayo overcomes this abnormality by simply cutting the

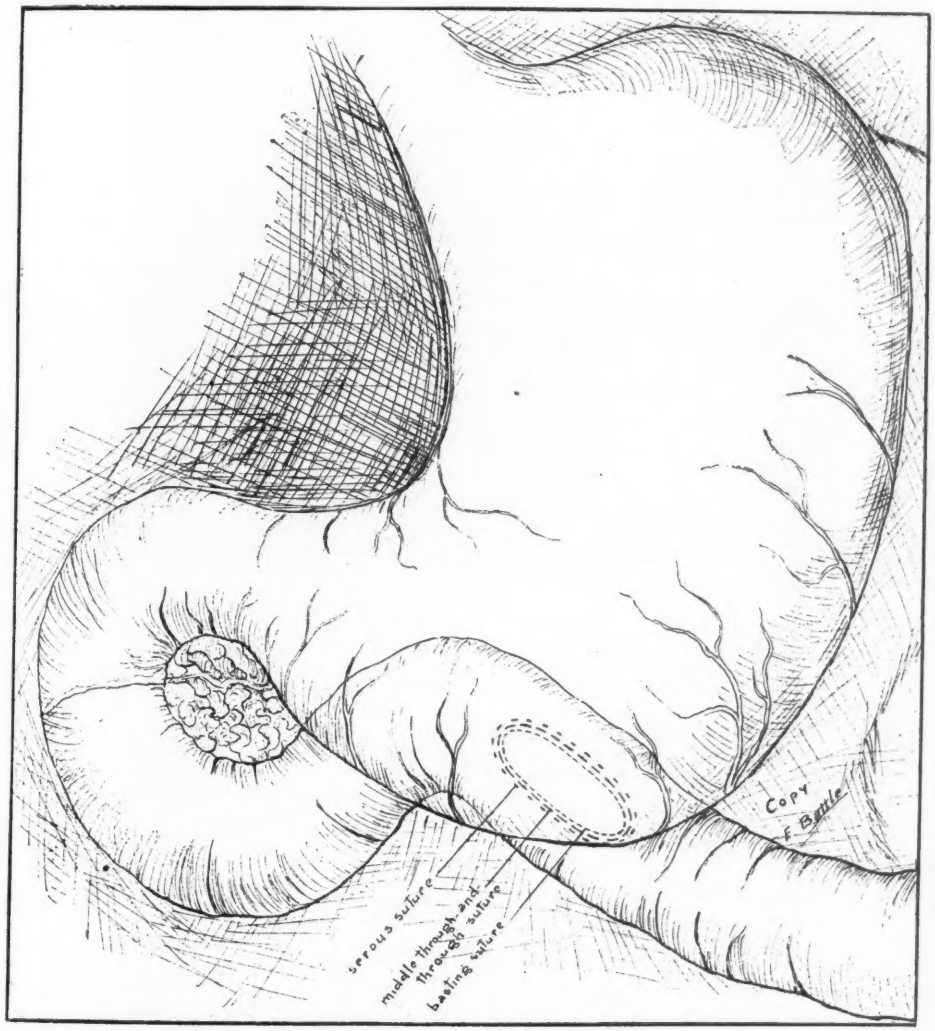


FIG. 3.—Gastro-Enterostomy. Showing the relation of the basting suture to the middle through-and-through and serous sutures as applied to the posterior no-Loop Mayo operation.

peritoneal fold (Trietz ligament) thus restoring the jejunum to its normal position; *i. e.*, running downward from right to left.

In the March number of *Surgery, Gynecology and Obstetrics* (11) Levison calls attention to an anatomical anomaly bearing upon this question. Levison dissected sixty cadavers with reference to the relation of the jejunum as it makes its exit from under the ligament of Trietz. He was surprised to find how widely the relations differed, and in one instance the jejunum seemingly made its exit under the ligament of Trietz and really was attached there, but instead of passing under the mesocolon at this point, as it normally does, it skirted along its under surface toward the

FIG. 4.—Showing small peritoneal fold, with intestine passing to the left. Normal form. (Illustration taken from Mayo's article on Relation of Trietz Ligament—Annals of Surgery, January, 1908.)

right to within two inches of the caecum before passing through the mesocolon. (Fig. VI.)

The writer has under his care at this time in St. Leo's Hospital a young woman who has an anomalous condition that is probably much more rare than the one just mentioned. On opening the abdomen, the peritoneal cavity, as we usually speak of it, contained only the colon and pelvic organs, while the small intestines could nowhere be seen. The case was one of general tubercular peritonitis, starting from infection in the Fallopian tubes. After removing the tubes and ovaries a search was made for the missing small intestine. It was found that the entire length of the small

FIG. 5.—Showing extensive peritoneal fold which turns the intestine to the right. (Illustration taken from Mayo's article on Relation of Trietz Ligament—Annals of Surgery, January, 1908.)

bowel, save an inch or so, was above and behind what appeared to be the mesocolon, and only the distal end of the ileum emerged through the mesocolon on the right side, close to the caecum. The finger was passed into the opening through which the end of the ileum came, and the small bowel palpated. Tubercles could be felt, involving all of the tissues within reach of the finger. After pulling several inches of the bowel through the opening and making a study of the case it was so clear that the condition was a congenital one that the ileum was replaced, feeling assured that in this instance certainly the surgeon could not improve on what the Lord had done. The volume of the small intestines caused the mesocolon to sag like a pouch even into the pelvis, and at first glance it was mistaken for a gastroptosis.

Neither this case nor Levison's have any direct bearing upon the question of gastro-enterostomy, except that a knowledge of the possibility of these anomalies might save the surgeon some embarassment, and shows that the jejunum cannot always be depended upon to be in its so-called normal position.

Moynihan (12) seeks to justify the Moynihan line, and says that he has tried making the anastomosis in the Mayo line and has not always gotten good results, bilious vomiting following in three cases. However, in one case attached along the Mayo line, the patient, dying later from cancer, an autopsy was done and "a distinct twist was seen in the jejunum." It does not seem as though an anastomosis done with "a distinct twist in the jejunum" is hardly a fair test of any operation, since to twist the gut is most assuredly

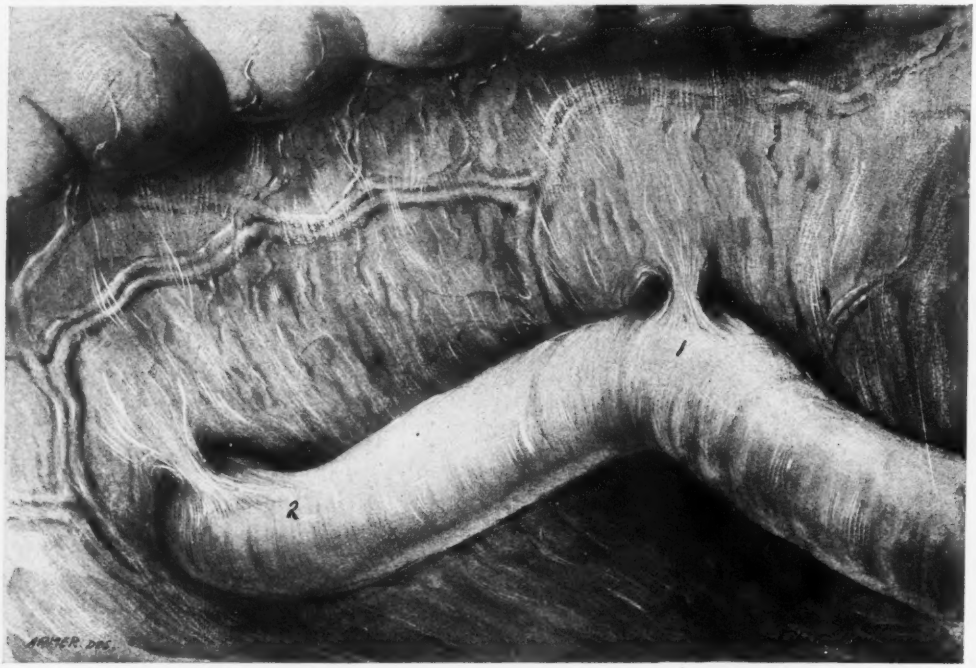


FIG. 6.—Illustration of anomaly, somewhat diagrammatic. 1, apparent exit of jejunum; 2, anomalous exit of jejunum. (Illustration taken from Levison's article on Gastro-Jejunostomy—Surgery, Gynecology and Obstetrics, March, 1909.)

not good workmanship. Moynihan says further that probably one line is as good as another, provided no twist be given to the gut. His own choice for some time past has been the vertical line, with probably a slight inclination to the right. By this method he has had 200 cases without vomiting. What splendid results when compared with the earlier operations with a mortality of 65.7 per cent!

While attending the Mayo clinic in November, 1905, the writer saw Mayo do a number of gastro-enterostomies by his method; *i. e.*, the posterior no-loop operation with the jejunum running obliquely from right to left. The operation seemed so rational, so workmanlike, and gave such excellent results that it appealed to him strongly. The writer has employed both the Moynihan and Mayo line, and has gotten excellent results in both, but is convinced that the Mayo line is the one freest from objection.

With, on the one hand, both mortality and morbidity eliminated; while on the other, comfort and prolonged life in malignant cases and restoration to health, in fact, life saved in benign cases, all of which is due, mind you, to the improvement in the mechanics of the operation, gastro-enterostomy has unquestionably won the right to a respectful consideration in all serious gastro-duodenal cases.

Resume.—We have traced the history of gastro-enterostomy from its inception by Nicoladoni with its high mortality and difficult technic through its many phases of evolution to the last word by Mayo and Moynihan, its greatest exponents, and it would seem that nothing more could be added to the mechanics of the operation, so simple and well-defined is its technic and so brilliant are its results. Be that as it may, the writer has recently devised and employed a measure which has been of positive service to him in facilitating the operation, and most assuredly adds an element of safety.

The Basting Suture.—The measure referred to may with propriety be called a "basting suture," as it is similar to the basting suture used by the seamstress. To properly understand the significance of the basting suture we must review briefly the histology of the stomach and bowel, as well as the behavior of their component parts during the course of a gastro-enterostomy as ordinarily done.

Histology.—The histology of the stomach and bowels is essentially the same in that each consists of four coats; serosa, muscularis, mucosa and submucosa.

The accompanying drawing (Fig. VII.) of a longitudinal section of the human jejunum was made from a mounting kindly furnished me from the laboratory of the Johns Hopkins Hospital. The drawing is in true proportions, and illustrates beautifully the various layers as well as the valvulae conniventes.

Special attention is called to the submucosa. Surgeons sometime speak of the submucosa as being the layer which offers resistance to the stitch in anastomotic operations. This resistance is an invaluable factor, since most of the tissues composing the walls of the viscera are cut through quite readily by any kind of a stitch. The mistake, however, is in crediting this important function to the submucosa, when in fact it is that portion of the mucosa known as the muscularis mucosa, which is the most resistant tissue of the visceral walls.

The submucosa is composed of loosely united connective tissue-bundles and elastic fibres through which run a network of blood-vessels and lymphatics. It is the looseness of the submucosa that gives trouble in anastomotic operations. Indeed, the connective tissue which composes the greater part of this layer is so spiderweb-like in its make-up that when the walls of the intestine or stomach are incised there is a separation of the layers, the line of cleavage being the submucosa, allowing the mucosa to fall away from the outer coats.

Behavior of the Submucosa.—Separation of the coats along the plane of the submucosa is

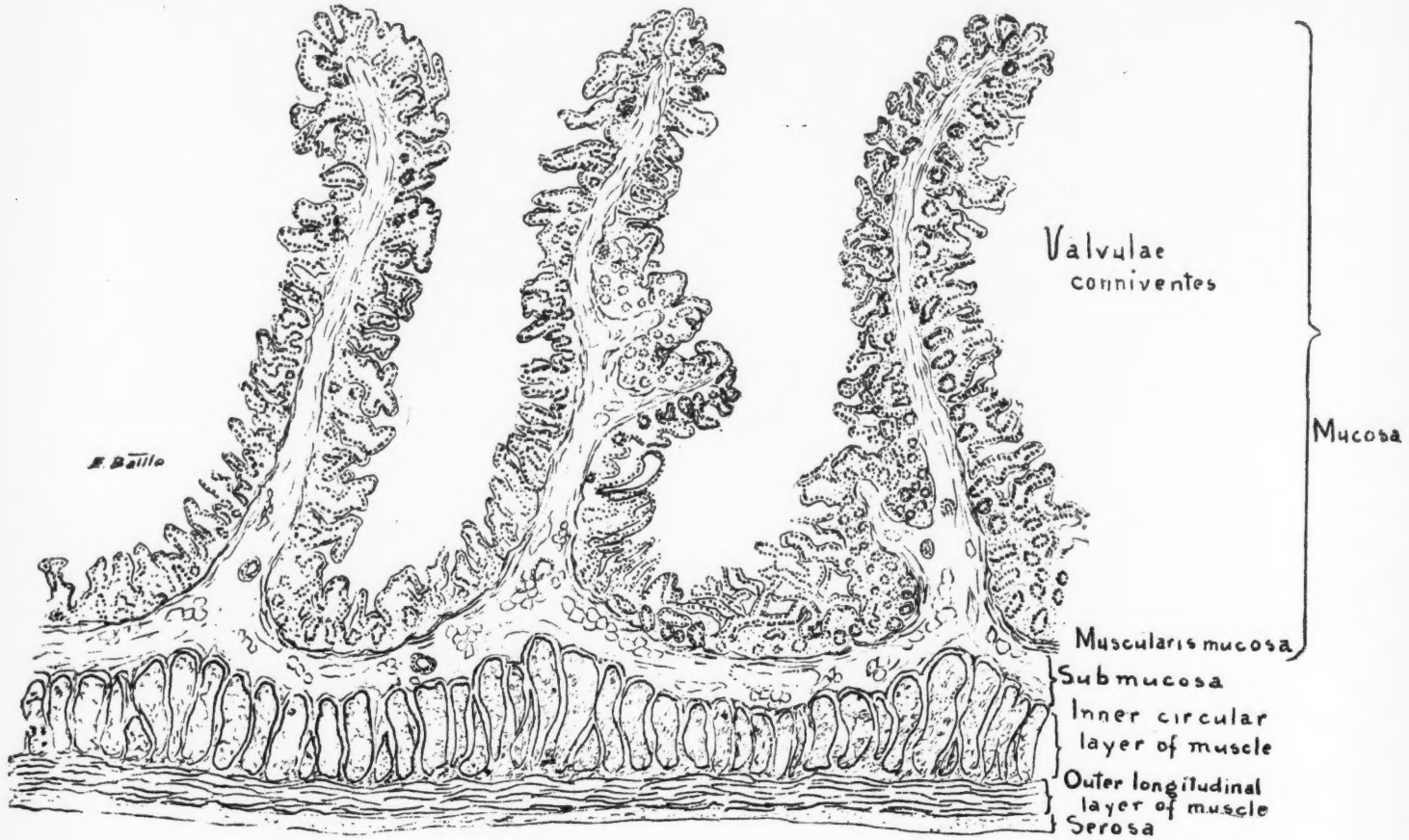


FIG. 7—Longitudinal Section of Human Jejunum. Showing relation of the submucosa to the mucosa on the inside and muscular layers on the outside.

exactly what happens while doing the operation of gastro-enterostomy. After the clamps are applied, the first row of sero-serous sutures introduced and the serosa and muscularis incised, it is seen that they retract markedly, sliding freely on the mucosa, leaving an elliptical opening. Now incise the mucosa and it flops down, no other word will express it, like a redundant lining in a sleeve. A reference to Fig. VII shows the uncut mucosa on the left, or stomach side, and the cut prolapsed mucosa on the right. The jejunal side also gives a faithful view of the behavior of the submucosa, which seems suddenly to have disappeared, leaving a wide, irregular space. In fact, to look at it now, one wonders how it can be called a "coat," so intangible does it appear.

The Difficulty.—In performing gastro-enterostomy the chief impediment comes from the impossibility of holding the mucosa smoothly against the muscularis while introducing the through-and-through sutures. Moynihan (13) recognized this difficulty and employs miniature volsella forceps to hold the layers together. The writer has tried Moynihan's plan, but finds it inexact, time-consuming and clumsy; the forceps being in the way.

The Remedy.—It occurred to the writer that a basting suture applied around the circumference of the incision in both stomach and jejunum, after the serosa and muscularis were incised, but before trimming away the mucosa, would hold the mucosa snugly against the muscularis, and thus prevent prolapse of the mucosa thereby facilitating the introduction of the through-and-through sutures. Fig. IX shows on the jejunal side the introduction of the basting suture. A full curved, round needle, carrying fine chromicized cat gut, is entered very near the margin of the cut serosa and penetrates all the coats of the bowel, coming out in reverse order. The needle is again entered, this time a short distance behind its point of exit, and again sweeps through all of the coats, basting the mucosa securely against the outer layers. The stomach side illustrates the basting suture completed and the mucosa cut away. It is to be noted that while the suture shows a loop on both the outer and inner surface that on the serosa represents an interrupted suture, while every line of the mucosa is embraced in the suture. In this manner the basting suture serves a two-fold purpose; first, it holds the truant mucosa in place, and second, it prevents most effectually any hemorrhage from the cut edges. It is to be noticed that the basting suture is applied very near to the edge of the incision, and in no way interferes with the through-and-through suture.

Fig. X shows the introduction of the through-and-through suture and the manner in which it turns in and effectually conceals the basting suture; while in turn, the sero-serous suture hides the line of the through-and-through suture.

It may be objected that a third suture would unduly increase the projection of the inverted edges into the anastomotic opening. This may be true theoretically, but practically it does not. A glance of the completed posterior row of sutures (Fig. X) reveals the fact that along the posterior row the basting suture is really within the embrace of the through-and-through suture; besides, the basting suture is applied so near the edge all around that the space occupied is negligible. Fig. XI gives a schematic view of the relation of the three rows of sutures.

The Illustrations.—A study of the drawings illustrating this paper will give a birdseye view of the history of gastro-enterostomy.

The original pen-and-ink drawings were made by my Secretary, Miss Elizabeth Battle. They reflect credit upon the artist, since from an anatomical standpoint they are more nearly correct than those usually seen. The illustrations borrowed from other authors are duly accredited.

Advantages of the Basting Suture.—1. The first claim that the basting suture

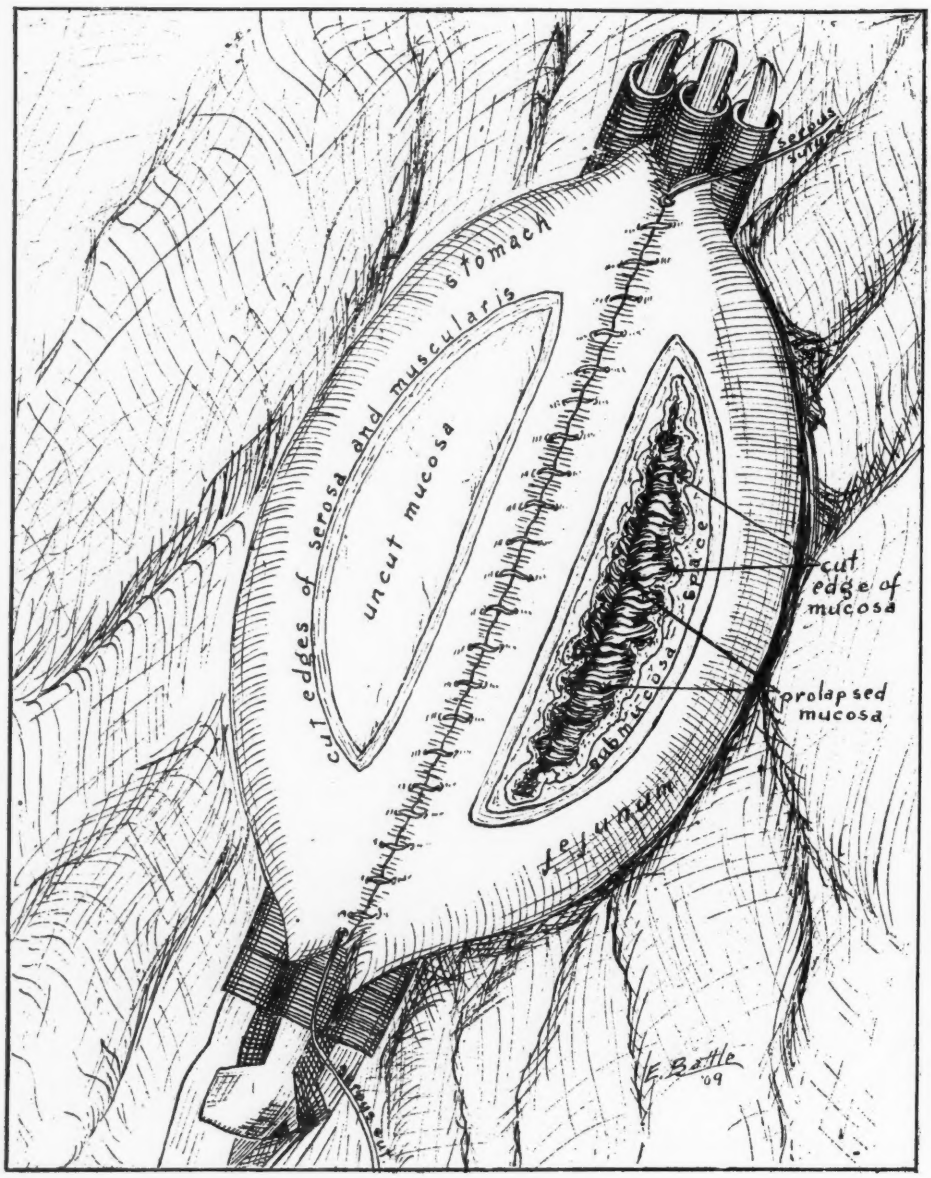


FIG. 8.—Basting Suture in Gastro-Enterostomy. First line of sero-serous suture applied. Serosa and muscularis of stomach incised showing external surface of uncut mucosa. All the coats of jejunum incised showing the mucosa prolapsed leaving a wide submucosa space.

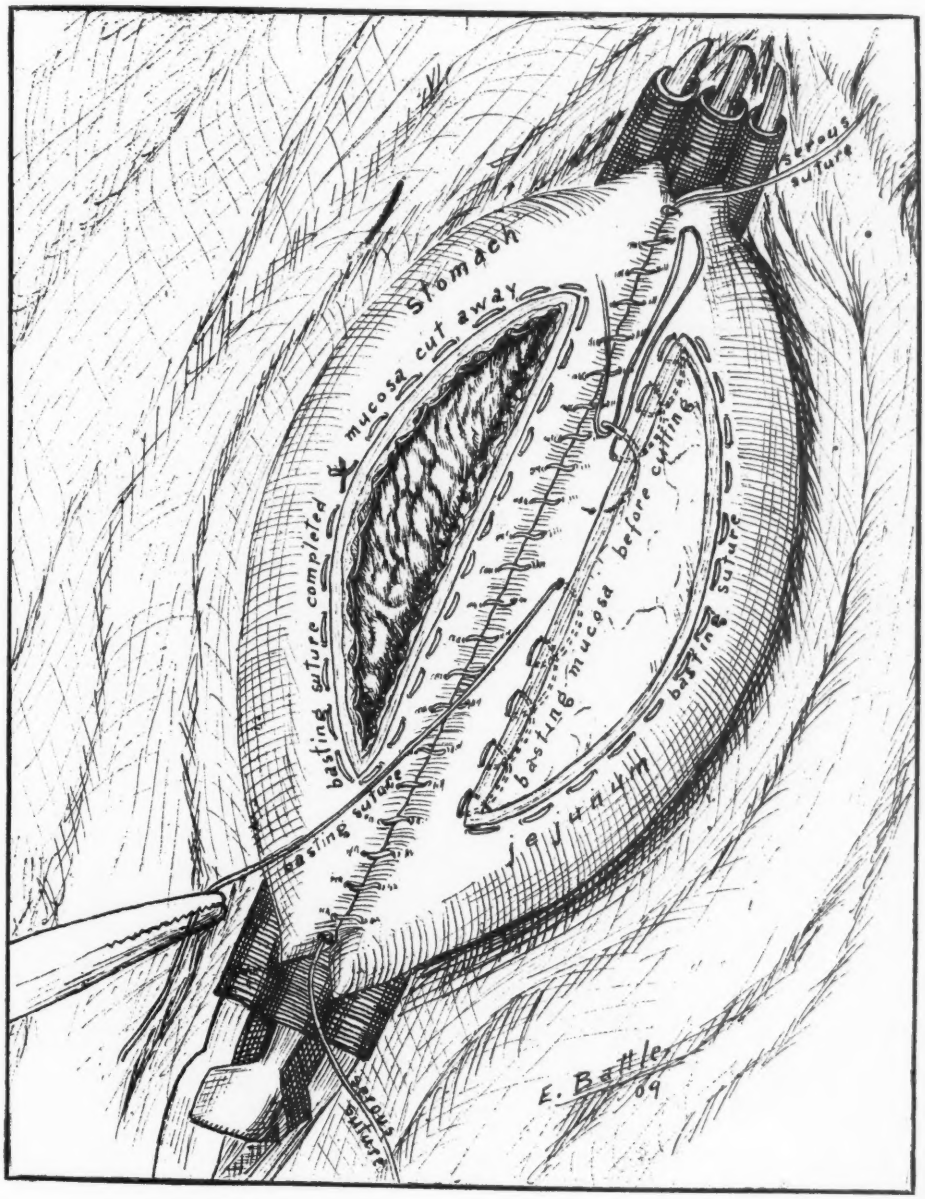


FIG. 9.—Basting Suture in Gastro-Enterostomy. Jejunum shows serosa and muscularis incised leaving external surface of uncut mucosa exposed and the basting suture being applied through all the coats of the bowel. Stomach shows basting suture completed and mucosa cut away. The submucosa space has disappeared.

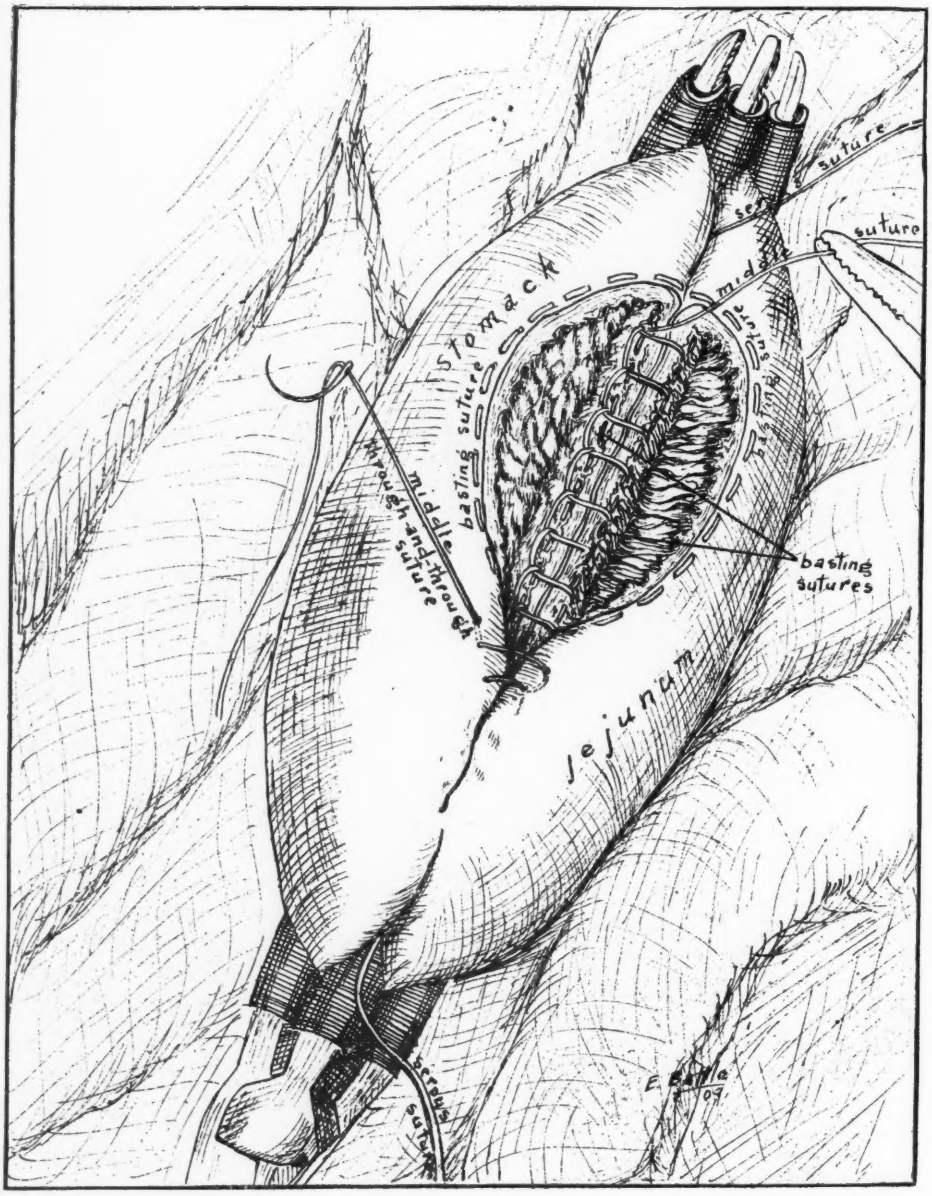


FIG. 10.—Basting Suture in Gastro-Enterostomy Basting suture completed and middle through-and-through suture being applied. Note that the basting suture shows when viewed from the inside, but its outer loop is turned in and completely hidden by the middle through-and-through suture.

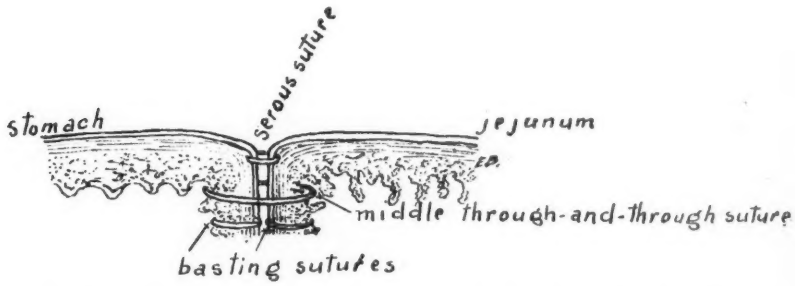


FIG. 11.—**Basting Suture in Gastro-Enterostomy. Transverse Section showing relation of serous middle through-and-through and basting sutures to each other and to the various layers of the walls.**

has is that it effectually removes an annoying hindrance to the operation, thereby shortening the time. It is a time-saver.

2. In no operation is it more imperative to handle the tissues as little as possible than is true in anastomotic operations. The basting suture holds the layers together so snugly and smoothly that handling the tissues even with instruments is reduced to a minimum.

3. The danger of hemorrhage from the vessels of the cut mucosa can not be ignored. In the writer's second case this complication occurred after the patient had been put to bed, and was not stopped till a gastrotomy was done and the bleeding vessel secured. A physician who had undergone a gastro-enterostomy by one of the best surgeons in the country, told the writer that he himself had a copious hemorrhage, per rectum, following his operation, and he knew of other similar cases. The basting suture is not only an absolute safeguard against hemorrhage, but the surgeon can inspect the cut edges of mucosa after the suture is applied and not have to depend on the rather blind chance of checking a hemorrhage by the pressure of his through-and-through suture.

4. The basting suture is not an hypothetical measure, but has been employed by the writer in his work at St. Leo's hospital, and with the greatest satisfaction.

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CARBOLIC GANGRENE OF THE THUMB FOLLOWING INJECTION FOR CURE OF SYNOVIAL GANGLION.

BY PAUL DEWITT, M.D., NASHVILLE, TENN.

That carbolic acid in varying strength sometimes produces gangrene when used as a wet dressing for wounds has been demonstrated, but I have failed to find a single case reported where gangrene followed its injection into deeper tissues. The writer has recently had an unfortunate experience with the drug, which he considers his duty to report to the profession.

The case in question was a synovial ganglion arising from the extensor tendons of the thumb. The patient, Mrs. C., age 45, neurotic temperament, and anemic. Following a succession of strains of the right hand a ganglion developed upon the extensor tendons of the thumb. It gradually enlarged, and was about the size of a pigeon egg when she came to me. She complained of some pain and a feeling of weakness of the thumb and wrist.

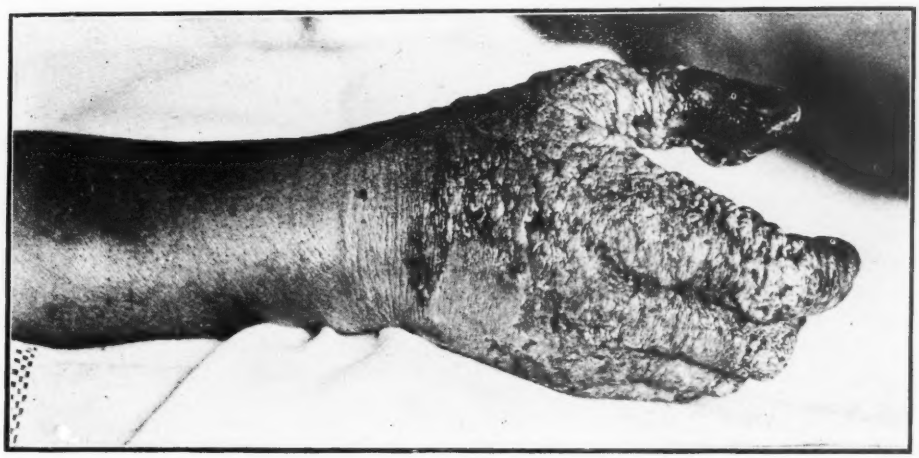
On March 12, last, I followed the well known and recognized treatment of injection, rather than open dissection. The solution, which I had prepared some time previously at a local drug store, was equal parts of pure carbolic acid and camphor. I had made several injections from this bottle with the most perfect results. The syringe was glass ("sub-Q") with needle of medium size. After boiling the syringe, scrubbing my own hands and cleansing the skin over the ganglion with alcohol and bichloride solution, I inserted the needle in a slanting direction to a depth of about one centimeter. Slowly withdrawing the piston, about 20 minims of the contents of the sac, synovial in character, were drawn into the syringe. Noting the depth of the needle, the barrell was unscrewed and contents ejected. I then drew up ten minims of the carbolic solution and injected eight minims into the sac. The pain following the injection was much more severe than usual, at which I wondered, but felt no uneasiness. I instructed her to report to me at 7 o'clock in the evening, three hours after the injection, if pain was severe. She presented herself at 7 o'clock, and I was amazed to find the whole hand greatly swollen with an intense dermatitis over the whole dorsal surface, including the fingers. Pain was intense, and there was some discoloration. Giving an injection of morphia, gr. 1-4, I instructed her to return home and keep hand and forearm immersed in hot water. A 9 o'clock I was called and found the pain still intense, with more swelling. Another hypodermic of morphia gr. 1-4 was given, and a couple of tablets left for the night, the hot water bath to be continued.

Early next morning the condition was worse, so I called consultation. Dr. John A. Gaines saw the case with me, and we removed her to the St. Thomas Hospital, where a hot saline bath was continued. At this stage it looked as though amputation of thumb and forefinger, including their metacarpal bones, would be a necessity, as the whole area was purple, and the entire dorsal surface of the hand covered with blebs from the dermatitis.

The temperature had not been above 99, nor the pulse above 90, and neither went above these figures at any stage of the trouble.

On the second or third day, phlebitis set up in the forearm and gradually extended to the shoulder. Simple support by a flannel bandage was all that was necessary for this complication, which subsided within ten days.

The accompanying picture was made on



March 19, one week after the injection, and shows the condition perfectly. Note the swollen hand and arm, the dermititis, and the discoloration of forefinger and thumb, with loosened skin. The injection was made at the cross mark.

On March 21, the moist heat was discontinued, and a dry sterile powder used.

Final result: Dry gangrene of distal phalanx of thumb, with line of demarcation and amputation through the joint. A large raw area between thumb and forefinger, with desquamation of whole hand. I skin grafted the raw area, and the hand is now healed.

Now a few statements. Four drops each of pure carbolic acid and camphor were used. The injection was made into the sac, for the needle was not withdrawn. Strict asepsis and antisepsis were practiced, and infection did not appear at any stage. The case was seen by many of the best-known local surgeons and physicians, and also by Dr. Jas. P. Tuttle, of New York, who happened to be in Nashville at the time, all expressing astonishment at the result and at the novelty of the case. All agreed upon idiosyncracy, but opinion was divided as to *modus operandi*. Some thought the cause was blocking of blood vessels through reactionary swelling, while others inclined to the neuropathic cause. Personally I am inclined to the neuropathic idea, that the effect was upon the vaso-motor nerves, causing a slowing of the blood current, with consequent oedema, and final occlusion of the blood current, resulting in dry gangrene. This theory seems to be substantiated by the idiosyncrasy, the sudden onset, the dermatitis, and the final clearing up of nearly the whole area.

SOME CONSIDERATIONS ON VISCEROPTOSIS. AN HISTORICAL REVIEW.*

BY ROBERT C. BRYAN, M.D., PROFESSOR DESCRIPTIVE ANATOMY. PROFESSOR GENITO-URINARY SURGERY, UNIVERSITY COLLEGE OF MEDICINE, VISITING SURGEON TO VIRGINIA HOSPITAL, RICHMOND, VA.

The literature upon visceroptosis is so voluminously comprehensive that a detailed and exhaustive consideration would be impracticable. The writer will, therefore, present only the terse views of various collaborators from 1885, since which time the contributions upon splanchnopototis have assumed a more assimilable form.

It is to Glenard that the profession is indebted for first calling attention to this disease. In his article (156) and in his contributions (157-170) through subsequent years to 1903, he repeatedly emphasized the anatomical dissociation of the normal abdominal relationship, the ptoses of various organs, and that train of symptom-complexes, neurasthenia emaciation and nervous phenomena which are the subjective manifestations of this dislodgment and functional inactivity. Although Virchow some twenty-two years previously had written historically upon "Unterleips-Affect". (A) and Kausmaul (B) had also presented views along the same line, it was Glenard's scientific, excellent and historical investigations that have given an identification to the disease of splanchnoptosis.

ETIOLOGY.

THE INFLUENCE OF THE KIDNEY ON VISCEROPTOSIS.—The writer had the opportunity before your body at its last meeting of presenting some views upon nephroptosis, and at that time gave statistics of various investigators to show the frequency of the condition. Harris states that fifty-six per cent. of all women have dislocated kidney on one or both sides.

Edebohls finds twenty per cent. of his patients with dislocated kidney. Godart-Danhieux from observation upon 603 women found thirty-five per cent. of them with a transgressing organ. Newman states that in 290 cases of floating kidney, 252 were in women and 38 in men, a proportion of about 7 to 1. And he also states that the right kidney is much more frequently affected than the left. In 173 cases 152 were on the right side, 12 on the left and nine involved both organs.

Henry Morris makes a similar statement. Litten and Israel claim that 85 per cent. of all dislocated kidneys are in women. Kuster states that a dislocated kidney exists in 94 per cent. of all women and six per cent. of men. Although this latter statement seems extravagantly high, abnormal mobility of the kidney is no rarity, is most frequently seen in women, and in those who have borne children.

The normal physiologic respiratory excursion of the kidney is one to one and a half inches. Therefore to speak of a movable kidney as one of pathological import is a misnomer. A dislocated kidney is one that oversteps these bounds, and, according to Glenard, movable kidneys may be of the following degrees:

First, is that in which the lower pole of the kidney can be felt on deep inspiration but recedes with expiration.

Second, in which a greater portion of the kidney, but not the upper pole, can be palpated.

Third, the upper pole can be palpated on deep inspiration.

*Read before the Medical Society of Virginia, Richmond, Va., October 20, 1908.

Fourth, the entire organ is palpable during inspiration and expiration. These two latter divisions belong obviously in the dislocated class.

The kidneys lay behind the peritoneum on either side of the vertebral column, and, according to Wolkoff and Delitizen, who have made a particular study of their anatomical anchorage, these organs are more or less securely fixed in normal paravertebral recesses. These recesses (Robinson, 403) in which the organs lie, do not hold the kidney fixed but act as a cylinder in which the piston (kidney) plays up and down. The restraint, help and support of these recesses can be demonstrated in a very striking manner by plaster paris casts. If they are well developed they tend to prevent abnormal motion of the kidney, for they are funnel-shaped in the well developed male subject, smaller below and equally deep on the right and left sides of the vertebral column. In the female subject they are shallower and cylindrical, rather than the usual funnel shape, and in those cases in which the kidneys are dislocated the recesses are remarkably shallow, this holding peculiarly true for the right side of the body. Women have not the muscular development of men.

The kidney is surrounded by a considerable amount of areolar tissue often loaded with fat, which capsula adiposa is constantly found in greater quantities about the margins of the organ and to a lesser extent anteriorly and posteriorly. This is derived from the parietal portion of the extra peritoneal areolar tissue. In some cases the fat in this enveloping membrane will be very abundant. In others, the fat is so scant in quantity that the connective tissue forms a thin transculent covering which might readily be taken for peritoneum or transversalis fascia. In other instances the fatty capsule is so large and so loosely connected with the kidney that the organ has room for movement within it. In still other cases the tissue surrounding the kidney is so loosely attached to the peritoneum and posterior abdominal wall that the whole mass is free to move, the extent of movement in this instance being limited only by traction on the vessels. In prolonged illnesses, wasting diseases and general emaciation there must necessarily be some absorption of this fatty capsule as there is absorption of fat in other parts of the body. And the writer believes that this capsula adiposa posesses absolutely no restraining influence upon the organ; if anything tends to its further dislocation by virtue of increased weight. Wm. Anderson, F. R. C. S. (C) at the annual meeting of the British Medical Association in Carlisle, July, 1896, discussed the function of the subperitoneal tissue and stated "structurally the subperitoneal tissue consists of highly elastic areolar tissue containing fat and transversed by bands of unstriped muscular fibre. In an average subject the areolar tissue varies in amount from a thick accumulation loaded with fat, as about the kidney, in the great omentum, mesentery, and in the cavum Retzii, to a gauzy film that may be easily taken for the peritoneum, when covered with laminae its interstices are of the nature of lymph spaces."

As an instance of its higher and only muscular organization the ligamentum suspensorius of Treitz, shows a true sustenaculra support, but histologically this areolar gauzy structure, frequently devoid of muscular bands and sustenacular aid, saturated in its dependencies with fat, inelastic, non-resistant and soft, certainly offers no restraining influence upon any organ which it may invest.

Embedded in the soft fatty substance surrounding the kidney is a layer of fibrous tissue to which the term "fascia renalis" is applied. This fascia surrounds the kidney and a considerable amount of the fatty capsule in the form of a sheath in which may be distinguished anterior and posterior walls. The sheath is open, deficient, gaping inferiorly and anteriorly, but closed above and to the outer side of the kidney by the aposition of its walls. The inviting line for dislocation of the kid-

ney, therefore, is essentially downward. The anterior inferior face of the kidneys for about two inches of its extent is intimately bound by fascial bands to the large colon—the hepatic flexure—which in turn, running through the great omentum is suspended only by that atonic areolar structure from the greater curvature of the stomach. And again, along the anterior and inner concave border of the kidney the duodenum is attached as it makes its bend in coming from the stomach.

The writer has entered into the anatomical site and the anchorage purposely as the influence and the mechanical significance of the kidneys, with support absent below and internally, constantly dragged upon by the unyielding colon and uterer inferiorly, must be transferred to the pyloric end of the stomach to which it is densely attached through the medium of the duodenum. Insufficiently immobilized primarily, by failure of closure of the fascia renalis inferiorly and internally, enjoying an unusual (piston and cylinder) physiological respiratory excursion, aggravated by pulmonary lesions and contractions of the diaphragm as in the act of coughing, sneezing, urination, defectation, deep breathing, singing, etc., distressed by the encroachment of enlarged neighboring organs, insulted by the constricting pressure of thoracic stays, supported by no ligaments, bands or peritoneal bridges, influenced constantly by gravity, pulled upon by the inelastic, dragging ureter, which is fixed below, and is constantly undergoing its rhythmical peristaltic waves from above downward, and finally the dead weight of the pulling hepatic flexure of the colon, seem to be of sufficient mechanical significance to explain this dislodgment which, according to some authorities, occurs in eighty per cent. of all women.

The association of dislocated kidney with the sinking of other abdominal organs, of the stomach in particular, has been firmly established. Nephroptosis is constantly identified with gastroptosis (Aaron I.), the colon and the small intestines (Arneill 10), Kumpf (258) in 1893 reported 100 cases of enteroptosis and in the attending nephroptosis he has always found a constantly subjective symptom in the form of a characteristic form of pain. From the navel to the greatest convexity of the arch of the ribs, suppose a line to be drawn, at an equal distance from the end of this line, in an angle of 110 degrees above—toward the epigastric wall—an energetic pressure is to be made, so that the finger tips press in against the abdominal wall close to the vertebral column, a cry or movement of pain always shows the presence of nephroptosis.

Godart-Danhieux (173) says, systematic research has demonstrated the greater frequency of nephroptosis than has been supposed. Mathieu among 306 women has found 27 per cent to 28 per cent. Fischer and Benzen finds the mobility of the kidney to be 17 per cent and 22 per cent, and he further says that Glenard in 1887 indicated the fact that a movable kidney without having any real pathogenic value was of great importance semeiologically. The ptosis of the kidney is a phenomena which accompanies splanchnoptosis. Robinson (403) in speaking of the etiology of nephroptosis says the main causes are (a) a predisposing body-form, (b) rapid loss of perineal fat, (c) rapid repeated gestations, (d) heridity-inferior anatomy and physiology, (e) yielding of diaphragm supports, (f) debilitating disease, and form of the renal fossa. This varies in different subjects. The narrower the distal end of the renal fossa the more immovable the kidney.

Schwerdt (438) states in the first month of 1896 he observed 95 cases of enteroptosis, six men and eighty-nine women. One patient showed an almost total enteroptosis but lacked the sinking of the spleen. In sixty-nine cases the stomach was displaced and atonic. Nephoptosis was present in eighty-six cases, on the left side four times.

THE INFLUENCE OF THORAIC BINDERS, CORSETS, STAYS, ETC., AS AN ETIOLOGICAL FACTOR FOR SPLANCHNOPTOSIS.

Wolkoff and Delitizen state that a tight band at the level of the ninth or tenth rib diminishes the depth of the renal recesses and thus favors nephroptosis. Senator calls attention to the elongation of kidney recesses and the absorption of perirenal fat by tight lacing.

Turck (503) considers the displacement of the colon largely due to the following general etiology: (1) Any condition that induces an increased capacity in the abdominal cavity. (2) Constriction of the thorax.

Cukor (80) says, regarding the role that woman's corset play in the disease of enteroptosis, is very important, not only in the local compression of the waist and in the atrophy following local pressure of the abdominal muscles, but in the fact that the constant pressure on the waist causes increased pressure abdominally, and leads to the sinking of the intestines and the neighboring organs. Measurements taken after the removal of the corset showed an increase in the abdominal circumference of from five to ten cm. The dislocating influence of the corset shows itself in time as a permanent deformity of the abdomen.

Gallant (148) speaks of the heavy skirt hanging at the waist and the constant pressure of the corset. As the spinal column lengthens it should carry all the viscera attached thereto upwards, but this compression at the waist line prevents it, the ligaments are stretched and the viscera disorted.

Senni (442) according to his practical experience is of the opinion that the etiology of hepatoptosis rests principally and conclusively upon the mechanical pressure of the corset and thus the liver must be forced under the vertebral arch.

Morris (335) says splints cause muscular atrophy in other parts of the body, why not in the abdomen by the use of corsets. The influence which hepatoptosis plays in the picture disease of splanchnoptosis and the etiology of the dislocation of the liver is, according to Robinson (402) as follows: Hepatoptosis is part and parcel of splanchnoptosis and depends on the same causes. The elongation of the hepatic ligaments are secondary to the relaxation of the abdominal wall. Further etiologic factors in hepatoptosis are the weight of the liver, cholelithiasis, weight of the gall bladder, laxity of elongation of the hepatic ligaments, trauma, as during childbirth, and disappearance of the visceral shelves. The chief immediate cause is relaxation of the ventral abdominal wall.

Ssaweljew (452) says, Kispert is of the opinion that the ligaments of the liver lose their strength through malnutrition and their relaxation follows.

Soupault (450) states that the numerous explanations of the cause of the mobile liver are not satisfactory as they do not fit every case. In fact all movable livers cannot be explained by one and the same pathogenia. It has been explained in two ways: (1) The liver is mobile because it is poorly sustained. (2) The liver is mobile because it is deformed. The good condition of the abdominal wall (anterior) plays a very important part in maintaining the liver in a normal position. When the strength of that is diminshed (as in enteroptosis) the liver is influenced by the loss of support to descend more or less into the abdomen. The sanguine tension (intra hepatic) contributes also to erect the lower border of the liver, and to maintain it in the upper part of the abdomen. To explain hepatoptosis, all authors invoke alterations in the different organs which sustain the liver. Longuet and Kirmisson signal the congenital absence of the coronary and lateral ligaments, while Lannelongue signals the absence of the suspensory ligament, but these are exceptional facts.

Francine (143) states it is impossible to separate gastroptosis from enteroptosis or a general splanchnoptosis, these conditions in their etiology and clinical manifestations complement each other. Dislocation of the liver is a very important factor in both enteroptosis and gastroptosis. It is difficult to diagnose and so is often overlooked. The relative frequency of this condition (gastroptosis) in the sexes is four or five in women to one in men.

Morris (335) says: Examination of many women with loose abdominal walls proves that the rectus abdominis muscles, seized in two hands, can be easily drawn apart for several inches. The hollow viscera then cease to do their work of supporting the liver and this viscus begins to descend. Suspensory and falciform ligaments elongate. The vena cava is deeply lodged in the substance of the liver, and at this point receives the hepatic veins. The liver fixed at the vena cava descends through the curve of the axis rotation, duodenum, plyorus and hepatic flexure of the colon go with it. The axial rotation of the liver brings the posterior lower border of the liver against the upper pole of the right kidney, and if this viscus is not already loose it now becomes so by the impact of the liver. When the hepatic flexure of the colon descends it is followed by the transverse colon.

Glenard (167) says the ptosis of the liver is due to a leveling; it may be lateral or it may be antero-posterior, under the influence of a reduction of the intestinal mass of the abdominal cavity and the dimunition of the sanguine tension (intra-hepatic) or to a hypertrophy, a hyperemia, or a steatosis.

Binnie (32½) observes that Terrier and Auvray in their article on the floating liver, refer at length to the function of the inferior vena cava as a support to the liver. This, according to Faure, by its close adherence to the central tendon of the diaphragm, plays an important role among the hepatic supports. Faure found that a force of 35-40 kilogrammes is necessary to tear the liver from the diaphragm, but when the inferior vena cava is divided, a force of 20 kg. suffices for the same purpose. From his experiments he is of the opinion that the pressure of the abdominal wall and of the intestines is a feeble support to the liver, only sufficient to prevent that organ pulling too heavily on its ligaments and to a certain extent diminishing the strains which the liver cannot fail to give its ligaments during sudden bodily movements. Landon believes the primary defect in hepatoptosis to be a distention of the belly wall.

Bouveret (46) states a certain fact in the history of enteroptosis that is little known. This is the distension of the biliary vesicle, without neoplasm or calculi, and is coincident with a marked descent of the liver. It is interesting to learn the role which this rare tumor plays in the clinic. He has met four of these cases in three years. The subjects were all women with advanced enteroptosis. In one case the right liver lobe elongated as if strangled, descended and formed a tumor in the right iliac fossa. The left kidney was sunk at the same time. The other abdominal organs were all loosened, particularly the transverse colon. The patient did not complain of the liver, nor of the vesicle. She had no hepatic colics. She had abdominal malaise, rather than real pains, was exceedingly constipated. Had all the symptoms of enteroptosis. This cholecystocele did not occupy the same position in all the subjects. The liver disturbances lengthened the vesicle and its normal supports. In one case the vesicle was in the epigastrium at the right of the umbilicus, and enlarged enough to raise the abdominal wall perceptibly. In another patient it had descended into the right hypochondria, near the right kidney, with which it could have been confounded. In another case it might have been taken for the ascending colon or even for the caecum. The size was also variable. In one instance it was the size of a hen's egg.

THE INFLUENCE OF THE ABDOMINAL WALL ON VISCEROPTOSIS.

Having considered the anatomic intimacy of the kidney with the pyloric end of the stomach and its influence upon that tube on being dislocated also the aggravating factor of hepatopsis upon visceroptosis, the writer submits the testimony of the following contributors upon abdominal weakness as a potent factor in the causation of visceral ptosis:

Cseri (75) has made many observations on the disease (enteroptosis) and is inclined to the opinion that it is congenital. The most convincing proof is that in the majority of his cases he has observed a curve in the lumbar segment of the spine.

Hemmeter (208) finds the etiology of enteroptosis a very difficult question, but is rather in favor of the theory of Rosengart, in the pathologic reversion of the location of the abdominal organs to the embryonic state, at least in congenital cases. He has found Stiller's sign of the tenth floating rib present in 78 out of 130 cases.

Robinson (400) says the etiology and development of the splanchnoptosis depends on the assumed base; whether splanchnoptosis be due to (a) congenital predisposition; (b) acquired defects; (c) reversion of embryonic conditions, or (d) a combination of the three preceding factors. In congenital predisposition there is inherent weakness or fragility of tissue. Acquired defects come from life's opposing forces. Reversion would be constitutional predisposition and therefore belong to (a). But the view which includes the combined factors is the more rational, because the disease is prevalent among all nations.

Stiller (460) discusses the nature of enteroptosis and concluded that it is a congenital anomaly. It occurs in early life as a consequence of congenital relaxation particularly of the ligaments. One of the certain indications is abnormal mobility of the tenth rib. This is due to fibrous instead of cartilaginous junction of the rib with the sternum.

Cumston (83) says heredity has been considered a predisposing cause for ptosis of the abdominal viscera but there is a very important and more general cause, and that is disturbances in nutrition, manifested by a particular condition of the fibrous tissue, allowing it to become distended and non-resistant.

Smith (447) says that enteroptosis is characterized by flabbiness of the tissues, by a lack of bodily energy, and by more or less backwardness of development. Such patients have a long narrow, more or less collapsed thorax, flaccid abdominal walls, prominent abdomen, changes in the character of the spine, and a general relaxation of muscular and connective tissue. Abnormal light bodily weight as the rule. The intercostal spaces are increased in the upper part of the thorax, but not below. The middle zone of the trunk is slightly increased in length.

Keith (124) has made most painstaking anatomical investigations and thrown some light upon this disease. These are his conclusions in brief: (1) The contraction of the diaphragm is the factor which produces the displacement of the viscera in enteroptosis, and that of the various parts of the muscle (the crura) are the most important in producing this result. (2) The "thoracic" supports of the diaphragm must have yielded or the antagonistic abdomnial muscles have been weakened before the displacement can take place. (3) The bands which fix the viscera to the walls of the abdomen are of quite subsidiary importance.

Moren (333) states that Webster regards the separation of the recti muscles and the stretching of the linea alba as a most important etiological factor in visceroptosis.

Vietor (511) has made a careful study of the development of the abdomen in animals and in man, in adults and in pre-natal and infantile life, and has established the proposition that the fundamental cause of splanchnoptosis is abdominal incompetence. If well developed, the abdominal walls not only contain the vis-

cara, but also retain them in position against gravity and other displacing forces. This is the competent abdomen. Competence of the abdomen is a developmental factor. It is a very unstable possession. In most individuals it is never attained, and when attained there is a constant predisposition to a reversion to a more or less incompetency. The tendency is more marked in the fourth decade and beyond.

Meltzing (329) believes the cause of visceroptosis to be the insufficiency of muscular tone of the abdominal wall.

Keith (239) believes that the displacement of the liver and stomach springs from two causes—either from relaxation or paresis of the abdominal muscles or, as is more frequent, the body cavity is constricted by the clothing so that normal respiration is impeded. In either case the visceral displacements are much the same.

Webster (532 1-2) claims that one important factor in the relationship of the abdominal and pelvic contents is the abdominal wall. Its fascial and muscular layers (its most important tissues) have a certain degree of tonicity which helps to maintain the trunk position, and to exert pressure on the abdominal contents. It shares this latter function with the diaphragm and pelvic floor.

Langerhans (268) considers gastroptosis due to various causes: relaxation of abdominal muscles being chief. He also believes that nervous dyspepsia may lead to gastroptosis and thinks there is a hereditary tendency to gastroptosis.

Davis (88) says the abdominal wall and the suspensory ligaments of the abdominal viscera have a certain mutual influence upon each other. In the act of lifting a heavy burden the abdominal ligament shortens, and when the ligaments have an extension, in consequence of the overfilling of the intestines, the muscles of the abdominal wall serve as a support. When this mutual action is interrupted either by a chronic weakness of the ligaments or wall gastroptosis is the result.

Bassler (22) attributes many cases of gastroptosis in women to the failure to properly support the abdomen after the patient leaves the bed following childbirth.

Treves (489) believes that abdominal ptosis, visceroptosis or enteroptosis depend upon a relaxation of the abdominal wall, and of the supporting ligaments of the viscera. The result is that the organs drop to a lower level in the abdomen.

Cseri (75) says the right transverse flexure of the colon, flexor hepatica, in consequence of the insufficiency of the weak, colico hepaticum, on which it is attached, sinks. In consequence of this descent there ensues a kink or angle where the ascending colon crosses the transverse colon. This, in the first place, causes a stoppage of the intestinal contents and in the second brings on an array of dyspeptic symptoms. The insufficiency of this ligament and the consequent descent of the flexor is, in Glenard's opinion, the point of origin of the entire disease. The fallen colon pulls on the ligament and we have a sinking of the stomach (gastroptosis), of the kidneys (nephroptosis) and of the liver (hepatoptosis). This finally resolves itself into the sinking of the entire viscera (splanchnoptosis).

If the views of Cseri were reversed and put at the door of the aberrant kidney as the original mechanical explanation of the sinking of the hepatic flexure, the question of coloptosis would assume a much more rational solution. If the kidneys were fixed, the flexura hepatica could not sink. The kidney prolapsing downward and inward, however, carries with it the colon, the omentum, the pylorus and the stomach.

THE INFLUENCE OF THE SPLEEN ON VISCEROPTOSIS.

Brown (51) says a movable spleen is usually present in coloptosis. It is not always recognized on account of the difficulty of diagnosis. If the organ is abnormally fixed, diagnosis is still more difficult.

Glenard (167) states that the analysis of twenty-seven cases of splenoptosis (upon 1,500 patients) confirms the theory that all cases of splenoptosis are accompanied by hepatosis, and more than that, that splenoptosis never exists alone.

A wandering spleen is only restricted by its peritoneal and properitoneal connective tissue belt.

TH' INFLUENCE OF THE PANCREAS ON VISEROPTOSIS.

There is no literature upon ptosis of the pancreas as an accompaniment to splanchnoptosis. With marked prolapse of the pylorus the head of the pancreas is bent about itself and kinked. Calculous formation, retention, cystic degeneration, interstitial pancreatitis develop to a degree determined by the angulations of the ducts of Wirsung and Sanborini.

PATHOLOGY.

It is evident that each abdominal organ cannot be taken up separately.

Robinson (401) in the examination of 600 adult autopsies found local peritonitis adhesions in over 80 per cent. The neuro-vascular visceral pedicle, the mesentery, becomes elongated and its roots glide distal-wards on the dorsal abdominal wall. This allows (a) elongation of the mesentery, (b) an excessive range of the visceral motion, (c) the abdominal and the pelvic organs pass distal-ward and become impacted in the pelvis, (d) splanchnoptosis compromises circulation and deranges absorption secretion, (e) disorders peristalsis, (f) traumatizes nerve periphery, (g) impairs nourishment, (h) produces indigestion, (i) invites constipation. After thirty-five years it is likely to cause stenosis or partial obstruction of the canals, tractus intestinalis, and elongation of other parts.

Davis (88) states that one of the principal causes is a general malnutrition. In consequence of the extension of the ligaments of the intestines the blood vessels naturally lengthen and there is circulatory obstruction in them. Nerves in the muscles are lengthened with them and pain arises. Narrowing of the peristaltic nerves and the unphysiological status of the intestines causes constipation.

Morris (335) has found that the large branches of the solar plexus from the liver, kidney and bowel are irritated, so that in addition to the mechanical disturbances of the viscera, a train of reflex disturbances of the sympathetic system, add to the distress, and there are various functional disorders.

Turck (503) states that in many cases there are no symptoms and in some cases of coloptosis the symptoms disappear but the ptosis remains. There are, however, permanent mechanical disturbances due to prolapse—viz.: dragging on the mesentery, pressure on the kidney and visceral muscle weakness, giving rise to chronic irritation of nervous symptoms with hysteria and neurasthenia.

Robinson (404) makes the following observation that the dilation of the stomach and duodenum (gastro-duodenal dilation) is due to pressure of the superior mesenteric artery, vein and nerve on the transverse segment of the duodenum. Observations of thirteen years on visceral ptosis subjects have demonstrated that when the coils of enteron lie in the pelvis, the superior mesentric artery vein and nerve compress the transverse segment of the duodenum so that dilation begins in the transverse segment of the duodenum on the right side of the superior mesenteric vessels and nerve. This compression of the duodenum by the superior mesentric artery, vein and nerve is typically manifest in a subject with splanchnoptosis or visceral ptosis, especially when lying on the back. It is not gastric dilation, it is gastro-duodenal dilation. When on the back the viscera, especially the enteronic loops, pass more and more into the lesser pelvis, dragging and tugging on the superior mesen-

tery artery vein and nerve, which compresses more and more the transverse segment of the duodenum. The general effect of splanchnoptosis is compromising of circulation (blood and lymp) and respiration, traumatizing nerve periphery, impairing elastic and muscular tone of abdominal wall and deranging secretions and muscular co-ordinations. Its results are malassimilation and neurosis.

Keith (239) emphasizes the fact that the kidneys rest on no visceral shelf as do the liver, stomach and spleen. There have been cases in which a floating right kidney has given rise to an obstruction of the bile ducts.

Goelet (175) called attention of the damage to the kidney by splanchnoptosis and says prolapse of the kidney has an important bearing on gynecological conditions. There can be no question about that. But it is also true that it is often overlooked as an etiological factor both in producing and in maintaining congestion of the pelvic organs and in producing symptoms which are referred erroneously to the pelvic organs.

The kidney, when prolapsed, overlaps the ovarian vein as it ascends along the spine and compresses this vein, thus obstructing the return circulation from the pelvis. When corset or clothing constricts the waist this condition is aggravated. The intestinal distention always associated with this condition is an important factor in forcing the kidney back against the spine. It would seem that the kidney being movable would escape this compression, but the colon, being attached to the kidney, drags upon it and holds it at the waist line, favoring compression. Prolapse of the kidney can interfere in the ovarian vein circulation in another manner. Think of the relation of the ovarian vein to the ureter; the vein in front and the ureter behind, when they cross. Now, when the kidney descends the ureter becomes bent upon and drags on the vein. Thus it will be seen that the prolapsed kidney is an important agent in causing congestion of the pelvic organs and in creating consequent diseased conditions.

Treves (489) believes that the affection is most common in women. There is no definitely assigned cause; over exertion, repeated pregnancies and injuries all play a part. The first part to descend is the right band of the transverse colon, then the stomach is drawn down, the pyloric opening is compressed and passage of food hindered. The orifice between the duodenum and the jejunum is narrowed and intestinal contents obstructed in passage. Small intestinal mass prolapses, lower part of abdomen if flatened, liver and kidney become movable.

POSITION OF THE STOMACH IN VISCEROPTOSIS.

Groede (183) says the stomach is fixed at two points, at the pylorus and at the cardia. Aside from this the neighboring organs and the abdominal walls offer their respective supports. The points of fixation are naturally most strongly weighted when the individual stands. In a "hanging belly" the sack of the stomach is shown by the Rontgen Rays to lie very deep. Also under normal conditions a change of position of the caudal stomach poles may be observed. When the intestines are full we see it change. The consequence is a narrowing of the rest of the stomach lumen. Therefore descent of the caudal stomach poles is not at all identical with descent of the stomach. In many cases it is not possible for the stomach to regain its normality when it is pushed too far downward. Then the entire weight comes on the two fixed points of support. That the pylorus can change its position in pathological cases is known, but since the cardiac end is fixed in the diaphragm it cannot move.

Meinert (327) writes at great length upon the normal and pathologic positions of the stomach. In the newborn the stomach is vertical, but it soon assumes the position described by Luschka. This remains through life unless influenced by bad conditions. After

the sixth year the vertical position is again present, in direct proportion to increasing age. This is especially true in girls. Fifty girls were examined at a public school; gastroptosis was present in eighty per cent. among girls of fourteen years. Among women examined, ninety per cent. presented gastroptosis. In gastroptosis the cardiac end of the stomach remains fixed at the twelfth dorsal vertebra, while the pylorus moves downward, leaving the epigastrium free of gastric tympany.

Steele (454) states that in splanchnoptosis the stomach approaches a vertical position and its shape has been compared by Killing to a fish hook. Glenard's theory that all displacements of the viscera arise from the presence of adhesions, causing displacement from mutual traction, is now generally held to be untenable.

Donath (108) in writing upon visceroptosis says: Obrastzow (in 1888) made observations in connection with enteroptosis and concerned himself principally with the location and borders of the stomach. He found the lower border of the stomach in men and women to be most frequently in the lower supra-umbilical third (this was the case in working women more than in those of leisure). In children under fifteen years the stomach seldom reaches the navel, in adults after fifty years the stomach was usually under the navel. The position of the stomach is a most important influence in the predisposition to enteroptosis.

DeNeit (97) believes that the determination of the lower border of the stomach is always made with reference to the normal position of the umbilicus—i. e., a point midway between the ensiform process and the pubis. He examined women only, fifty-eight in all. In thirteen he found gastroptosis, in eleven subvertical position, in seventeen a combination of these conditions, in eleven normal relations, while in six the exact condition could not be well determined. In every case he determined Rosenheim's (the greatest diagonal measurement) the height and breadth of the organ, and the position of the pylorus.

Berry (25) from an examination of fifty stomachs concludes that a cardiac valve is constantly present, or at least in fifty per cent of all cases of splanchnology. This valve, which projects downward from the upper and posterior portion of the cardiac opening, has a crescentic shape, it is small, but is supposed to be functional. It is suspended and may swing either way and its resistance may be easily overcome by the acts of eructation and vomiting. The pyloric orifice was determined definitely to be oval (14 mm by 18 mm) with the longest axis running obliquely from above down and backward; occasionally the direction of the axis may be vertical or horizontal. One rare occurrence was found in several cases—viz.: accessory pyloric valves of crescentic shape, and variably situated. The greatest width was 13.1 cm., and the length from top of fundus to the lowest point of the greater curvature 27.8 cm. Transverse diameter, contained two and one-half times in the vertical, was shown by comparison to exceed the antero-posterior. In the woman the cardiac valve is more frequently found. There is also a greater difference in the small and great curvature. In the male it is as 1 to 3.

Chambers (58) says with regard to gastroptosis it is rare to see displacement of the cardia. This is probably the only point of the stomach which is not freely movable. The pylorus is usually displaced downwards, sometimes below the navel. Form and position of the stomach are determined principally by the location of the pylorus and lesser curvatures. The concavity of the lesser curvature becomes less and is directed more to the right. The pylorus is sometimes prolapsed so as to produce an almost vertical position of the stomach as at birth. There is a loop or crescent displacement in women whose abdominal muscles are much relaxed.

THE X-RAY IN VISCEROPTOSIS (AND IN GASTROPTOSIS IN PARTICULAR.)

Worden (532) made a study of forty cases of gastric or gastro-intestinal symptoms. The

following methods were used: Inspection, percussion, auscultatory percussion, auscultation with the tuning fork, inflation with carbonic acid, gas or air, illumination by the eletcric diaphone with the aid of fluorescent solutions, and the use of the skiagraph. In some cases skiagraphs have shown marked prolapse, which repeated physical examinations had failed to note. The upper curvature and the pylorus were shown very clearly. Mechanical difficulties in stomach drainage can be recognized especially when the stomach bends sharply. In these forty cases the skiagraphs showed gastroptosis in thirty-one. The degree of ptosis varied from cases in which the lower border reached the umbilicus to cases in which the descent of the stomach was complete.

Leonard (286) states that in one case of gastroptosis he was able to obtain a good view of the stomach's location by first washing it and subsequently introducing an emulsion of bismuth. He then examined the patient with the fluoroscope.

Pancoast (353) says in order to obtain a picture of any particular structure of the body, that structure must be capable of absorbing the rays to either a much greater or a much less degree than the surrounding tissues. A collection of gas in the colon is represented on the plate as a darker area because the gas displaces the soft structures which throw a shadow, while it offers practically no obstruction to the passage of the short ether waves. The primary object of the radiographic examination of suspected gastroptosis is to determine the presence of the ptosis and its degree. But the radiograph will do more than this since it also may reveal possible factors in the etiology of the condition or suggest the appropriate therapeutic measures and it will frequently demonstrate the anatomical results of treatment.

Einhorn in 1889 introduced an electric light into the stomach making it transparent through the abdominal wall. This gastro-diaphany has been superseded by the X-ray.

SYMPTOMS AND DIAGNOSIS.

Whether it be the stomach, intestines, or kidney which is to the front in the disease-picture is of but little consequence, they all belong to one great symptom-complex. The prominence of one organ over another determines only the vulnerability of that organ. Again, all of these organs may be badly dislocated, giving rise to no distinct symptoms, but rather to that obscure train of intestinal indigestion and slight abdominal discomfort which is believed to be consequent upon some degree of visceral dislodgment.

Lea (274), Donath (107), Ratterman (385) have written upon and emphasized the more common symptoms of splanchnoptosis as borborygmus, eructations, malaise, nausea, vomiting, faintness, headache, irritability, constipation, constipation alternating with diarrhea, palpitation, neuralgia pains, occipital pains, spinal, referred to the organ, oppression and fever.

Ratterman (385) also called attention to the "floating rib of Stiller" as a significant sign.

Schwerdt (438) speaks of Glenard's "Proof of Pressure," which is as follows: Both hands are placed below the navel and an equal pressure above and below is made. If splanchnoptosis is present the patient at once feels a great relief. This writer also calls attention to the fact that in splanchnoptosis the anterior abdominal wall was often distended with gas, but depressed in the center and flattened in its entire breadth; was sometimes so thin that the intestinal knots could be seen through it and by peristaltic unrest it was moved up and down.

Dawson (89) states in reference to the diagnosis of gastroptosis that the subject is frequently spare and stoops, that the skin is dry and lax, and the thorax elongated.

Ewald (133c) has made some bold corrections on Glenard's symptomatology. One is that the epigastric pulsation of the aorta is in no manner a pathogomonic sign of enteroptosis as this symptom is always present when-

ever there is relaxation of the diaphragm and marked emaciation.

Kuttner (261) states that in all cases of this malady there seems to be a considerable reduction in the hemoglobin of the blood, thirty-eight cases that they counted giving an average of 77.2 per cent.

Mager (305) says the facial phenomena which was first observed in tetanus, the convulsive movement of the entire facial area, or a part of it by percussion, has since been found an accompaniment of other diseases. He has observed it in 40 cases of enteroptosis and in various degrees. Usually it has been double-sided. He considers this facial phenomena, as in tetanus, to be caused by intestinal disturbances, having their origin in auto-intoxication. By therapeutic influences on the intestine it can be made to disappear. The intestinal disturbances in enteroptosis are primary, and the facial symptoms secondary. The question why following intestinal disturbances, facial convulsions should sometimes appear, and sometimes tetanus, is answered by Mager, that tetanus requires in addition an insufficiency of the epithelial corpuscles of the thyroidae.

Lockwood (298) has made a study of forty-five cases in age from 20 to 70 years, thirty-six cases were between 25 and 50 years, the "storm and stress" period. Laxity of the abdominal wall was not a marked feature. Right kidney displacement in one half of the cases. Did not find the corset responsible for a single case (this contrary to Flexner and Meinert). Only one case showed chlorosis. He disputes the statement of Meinert that gastroptosis exists in every chlorotic girl. Stiller's sign of neurasthenia, the mobility of the tenth rib, was not always looked for, but when sought the rib did not seem to be detached. He thinks that gastroptosis is more common among the upper classes and more in private practice than in hospitals.

Again this same writer (299) among 2,000 patients has observed gastroptosis in 351 cases, making 17.5 per cent of all gastric and intestinal cases due to gastroptosis. This is more than twice the frequency of gastritis, the latter being only 8 per cent. There is a great similarity in the clinical histories of these 351 patients, so that it may be asserted that gastroptosis runs a course which is typical and characteristic. Neurasthenia, with its varied symptoms, is proportionate to the advance of the disease; it contributes a great variety of symptoms of increasing severity. Constipation is present and is due to the atony of the colon. Often the colon sags in its transverse portion. The "habitus enteropticus" is present. This means the long narrow thorax and abdomen and a costal angle under ninety degrees. The sharper this angle the more dispostition to splanchnoptosis. He regards the enteroptic habit as one of the most important conditions in gastric pathology.

Hamilton (195) observes that when the abdomen is pendulous, the nervous features are less pronounced than in the subject with the abdomen flattened. Typical enteroptosis may result from inflammatory processes in the abdomen. Any of the abdominal organs may be displaced in the disease. The colon, small intestines, stomach, right kidney and liver, are the first to alter their relations. This condition is due to an atony of the nervous system with a corresponding relaxation of the muscular structures of the body. The diagnosis is comparatively easy. The epigastrium is hollow, the two lower quadrants of the abdomen are quite prominent even when the patient is reclining. The lesser curvature and its relation to the greater curvature is most important to ascertain. If the lesser curvature can be demonstrated, some displacement exists. The amount of displacement is to be measured by the relation of the lesser curvature to the umbilicus. Palpation usually reveals a movable kidney, and the liver, when displaced, is usually more prominent in the epigastrium; it may be easily rotated on its long axis.

Aaron (1) says epigastric pulsation is fre-

quently present, constipation always, nervous symptoms are pronounced.

Treves (489) states that the symptoms are many and distressing. Irregular bowels, with constipation as the rule, ocasionally diarrhoea. Stomach and intestines usually dilated.

Brown (51) says the symptoms are many. Urine, blood and gastric juice are generally normal, but tenderness is usually revealed in the epigastrium, lax tension of abdominal wall and a cord-like transverse colon, Glenard's "corde transverse colique."

Glenard (168) says the malady of "ptosis" is a "sickness of every day." Among 100 patients suffering from trouble of the general classification of "intestinal gastro-dyspepsia" thirty have ptosis as the cause of the dyspepsia or the neuropathy. If the practitioner does not recognize the pathogenic ptosis he will be impotent to influence the disease, he will cure the patients if he makes the right diagnosis. It has a symptomatology, a pathogenesis an evolution and a treatment which is peculiar to itself. Under the name of splanchnoptosis is expressed the idea of a simultaneous of all the other ptoses. Multiple ptoses have been demonstrated frequently in the same subject. The term enteroptosis designates not alone the prolapses of the intestine but an "ensemble" of all the symptoms which accompany the existence of one or more ptoses in the same individual. Enteroptosis may exist without nephroptosis and without hepatoptosis, but the reverse is not ture. Gastroptosis is always associated with enteroptosis, the one is not without the other because of the anatomical connection of the intestines and of the stomach.

This same writer again emphasizes (167) that the indirect signs of gastroptosis are taken from the organs in which prolapse is easier recognized than those of the stomach and are implicated by their anatomical connections with the viscera. The direct signs of gastroptosis are the perception of relief in front of the vertebral column by the procedure of gliding (if the subject is much emaciated), relief of the pancreas, relief of the superior plicature of the stomach, relief of the stenosis of the transverse colon. But there is another sign indicated at the seat of the large curvature and is at the same time a sign of gastroptosis; that is the sound of the gastric gurgling in the sliding. This is a sign that the gastroptosis is limited to the pyloric region that the great tuberosity is not reduced and that the cardia is in place at the twelfth dorsal vertebra, this is "partial gastroptosis," what Bouvert calls the "vertical dislocation" of the stomach.

TREATMENT.

Edebohls (121) presents a synopsis of the various mechanical means which have been devised for the fixation of movable kidney in nephroptosis. (1) Simple bandages and apparatus embodying a special kidney pad. (2) Simple bandages supporting entire contents of the abdomen sustaining and somewhat immobilizing the movable kidney or kidneys, on top of intestinal mass. (3) Relief is either from an elastic bandage sustaining lower two-thirds of abdomen or from a long low reaching corset. (4) Relief obtained in any case will depend upon the presence and the degree of associated enteroptosis. Greater enteroptosis, greater relief from bandage or corset. Kidneys movable without general enteroptosis get little relief from apparatus. (5) All forms of apparatus with special kidney pads or trusses are to be rejected. They are impotent to fix and sustain a movable kidney and the pressure is injurious to either the kidney or a neighboring organ especially the veriform appendix. (6) Where relief cannnot be obtained from proper apparatus nephropexy is indicated.

Gunzburg (186) says that relaxation of the peritoneum with depression and abdominal movement of the viscera, causes such varied suffering that there is a constant therapeutic striving for a remedy. If neglected or only treated by massage, bandages, etc., the relaxed abdominal wall becomes almost incap-

able of functional activity, and has a relaxed extension of the abdominal cavity as a natural sequence. Patients and physicians seek to remedy the trouble by taking less food. No wonder that the fatty tissues are used up and the abdominal organs are rendered movable, but abnormally so. These patients should be at once put upon a nutritious and sufficient diet. But fluids should be moderately indulged in as they depress the stomach still further. Any kind of "water cures" would utterly fail in enteroptosis, many of these cases are very much troubled with gas. The yeast-medication obviates this formation perceptibly and he recommends it in many cases.

Rotgans (417) states that in cases of enteroptosis and "floating" kidneys he employs a bandage which he has made from a gypsum model. It consists of a large pelote whose lower border lies directly over the symphysis and the "Poupart" bandage. This acts in such a manner that by the upward pressure of the abdominal viscera the kidneys get a better support. The pelote is fastened with two steel pins which by means of two soft pelotes is placed against the sacrum. The lower abdomen is wrapped in a broad girdle of plaster. Before the plaster hardens the hand is laid over the symphysis and both regions of the groin laid flat on the plaster bandage, and pressed flat gradually. The pressed place of the plaster model gives the shape to the pelote.

Bassler (22) advises the wearing of a support for a number of weeks after confinement. An attempt also should be made to strengthen the abdominal muscles by frequently repeated voluntary contractions of the recti below the umbilicus; also in a dorsal position elevate the thighs, the legs being at the same time extended, elevation of the body to an erect position, the feet being held down. When faithfully carried out it will render operation unnecessary and incidentally add weight.

Blecher (37) says that operative treatment of enteroptosis is rapidly taking the place of the old method of bandages. Radical operations of the nephroptosis paved the way. Hartmann, in 1899, performed an operation for vertical dislocation of the stomach. But still this method has not yet reached perfection. In the fastening of the stomach the same methods cannot be used as with the kidneys. They have a broad and solid growth with the back abdominal wall. The stomach, on the contrary, is an organ that normally is influenced by every change in the filling of itself or of the intestines, and by every alteration of the abdominal pressure; within certain limits its position is being constantly changed. An ideal gastropexis must fasten the stomach without curtailing its mobility in relation to the peritoneum and other organs. The bad influence of the dislocation by enteroptosis on the movement of the contents of the intestines has been much argued. Glenard gives it as his opinion that dyspepsia is the consequence of enteroptosis, and that neurasthenia is caused by it. In the author's own case the shortening of the ligamentum gastrohepaticum, causing relaxation of the parts running in it, was sufficient to bring about recovery, without fixation of the stomach. The chief cause of the troubles in the superextension of the suspensory ligaments must be sought, for the dislocation of the flexura duodeni and the impeded mobility are seldom, or in a slight degree, to be considered. This applies to the stomach and all depressed organs. The enteropexis seems not to be indicated as long as the enteroptosis is still in the incubation stage; the languor which is present must be controlled and prophylactically tested to retain the elasticity of the epigastric area, and an avoidance of all injuries which would encourage the enteroptosis.

Curti (85) is of the opinion that splanchnoptosis is a hernia of all the viscera whose sack is through the abdominal wall. For a cure the exits must first of all be narrowed. He had a clinical case of plastic abdominal

suture. He made an incision from the upper abdominal region to the os pubis in the abdominal wall and took off the ring of the navel. Pulled the Mm. recti out of its back connection and sutured the back muscle connection of the M. rectus and the peritoneum of one side with the back connection of the M. rectus and the peritoneum of the other side, so that the two peritoneal surfaces came together; in this way he left a lobe measuring 4 cm. on each side. This flap he brought under the M. rectus of the right side and fixed it here with a single suture. Then the Mm. recti were laid upon each other and sutured and opened their exterior connections and sutuerd the skin. The result was good.

Hodge (220) reports a case of gastroptosis. Laparotomy in the middle line below the ensiform. Lesser curvature about half way to the umbilicus, greater curvature three-quarter inches below the umbilicus. Pylorus opened, gall bladder normal. Three transverse rows of interrupted silk sutures were put in the gastro hepatic ligament, bringing stomach well up under the liver. Abdomen closed in layers. Perfectly well in three months.

Crede (73) states that of all the operations relating to the intestinal canal and the stomach that gastro-enterostomy is to be regarded as the most important. Wolfler was the first to perform this operation on the front side of the stomach. Hacker followed, performing his operation on the back side. Both methods have since been used by numerous surgeons with some modifications.

Coffey (65) describes a new operation for gastroptosis. The omentum as it comes off from the greater curvature of the stomach is attached to the abdominal wall. The sutures are introduced about one inch from the stomach, and in such a manner as to avoid the large blood vessels. In one of the cases operated upon, the lesser curvature of the stomach was almost two inches below the umbilicus. The omentum was stitched to the abdominal peritoneum about one inch above the umbilicus by means of a chromicized catgut suture. The result in the two cases operated were entirely satisfactory. The first case has practically no disturbances of digestion now, while previous to operation her suffering had been extreme.

Duret (114) recommends elevation of the stomach in gastroptosis. His operation is as follows: Continuous fine silk suture from right to left through first the fascia, muscle and peritoneum of the abdominal wall, and the serosa and muscularis of the stomach, near the lesser curvature; then twice, at short intervals, through the parietal peritoneum (left intact in the incision) and the serosa and muscularis of the stomach, following the line of lesser curvature, and finally through the peritoneum muscle and fascia of the abdominal wall of the opposite side. This suture placed in the wound just below the xiphoid cartilage, suture knotted and stomach elevated and lesser curvature firmly fixed to abdominal wall. Two years later patient's health much improved, had gained twenty-five pounds.

Rovsing (419) makes a distinction between women who have a virginal strong abdominal wall and those who have borne several children in cases of splanchnoptosis. The abdominal wall of the latter is very frequently weak, relaxed and dependent. The virginal splanchnoptosis affords the most operative treatment. In a movable kidney case Rovsing has been successful in 73 out of 75 cases. He recommends operative treatment of splanchnoptosis in women when the patient can get no relief from apparatus and in virginal form even more.

Terrier and Auvray (469) write on the surgical treatment of movable liver. Glenard called movable liver hepatoptosis. In partial hepatoptosis a part of the liver becomes hypertrophied and forms a movable lobe. In total hepatoptosis the entire liver is dislocated and there is an abnormal mobility. The his-

tory of hepatoptosis has been for a long time in the purely medical domain. The first observation seems due to Heister (1754); Lubauski (1843) wrote on the same subject; Cantani (1866); Blet (1876); Legg Wickham (1877); Muller (1882); Landon (1885); Glenard (1885). But the last named author had enteroptosis for his chief object and the liver only as it was associated with enteroptosis. Billroth (1884); and Tscherning (1886) performed the first partial operations by fixing the floating lobe of the liver to the abdominal wall. Gerard Marchant (1891) in a case of total hepatoptosis practiced the first total hepatopexia. Since then many operations for a dislocated liver have been published.

CONCLUSIONS.

1. That women who have borne children are peculiarly susceptible to nephroptosis.

2. That women who have borne children are peculiarly prone to splanchnoptosis in about the same ratio, 6 or 7 to 1.

3. That atmospheric pressure has nothing to do with the support of the abdominal viscera.

4. That the pylorus receives a complete peritoneal investment, and is therefore movable.

5. That the kidney is dislocated in a large per cent of women.

6. That the kidney is intimately bound to the pylorus.

7. That with the dislocation of the kidney the pylorus must move.

8. That the direction of dislocation in nephroptosis can be only downward, or more rarely downward and inward.

9. That the stomach in gastroptosis shows a more vertical position characterized by pyloroptosis.

10. That there is an absence of the normal elasticity of the peritoneal and properitoneal connective tissue supporting bands in all the pelvo-abdominal viscera in cases of splanchnoptosis.

11. That replacement fibrosis in the ligament of Treitz tends to the further ptosis of the pylorus.

12. That ptosis of the pylorus means traction on the gall bladder, on the duct of Wirsung and on the duct of Santorini.

13. That ptosis of the pylorus means sinking of the stomach and transverse colon.

14. That sinking of the stomach and transverse colon means overstretching of the anatomic and physiologic support of the stomach, the gastro hepatic omentum.

15. That with coloptosis there is an angulation at the hepatic flexure and engorgement of the caput coli (appendicitis, typhilitis and perityphilitis.)

16. That with coloptosis there is a constriction of the superior mesenteric vessels with stasis and passive hyperaemia in the mucosa of the intestines.

17. That lavage is of value.

18. That rectal and colonic irrigations are of benefit.

19. That electric and hydriatric measures should be employed.

20. That properly fitting elastic binders laced very tightly upward are of the greatest comfort.

21. That operative interveption should not be recommended until palliative measures have been exhausted.

22. That gastro enterostomy is of only temporary, if any benefit.

23. That the operation of choice is Hodge (see 220.)

24. That the right kidney should be anchored in every instance.

Dr. Bryan has made an exhaustive search of the literature on the subject treated in the above article consisting of some 600 references, but the bibliography was so complete and exhaustive that we were unable to give the space to it. Any doctor interested in this subject will do well to procure a copy of the bibliography from Dr. Bryan.

THE CAUSES OF PERITONITIS.

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This great and finely-developed lining of the abdominal cavity and covering of the viscera contained therein perhaps stands third in frequency of involvement when narrowing our field to abdominal surgery being outdistanced only by the appendix and gall-blader. It is the great barrier that separates those parts of the inner man contained above the diaphragm and below Poupart's ligament. The peritoneum, coming as it does from the hypoblastic layer of the blastoderm, is most intimately associated with the formation of the hind, mid and foregut in the development of the embryo from the ovum. During this process of expansion, inversion and interconnection of the gut, liver, spleen, etc., the peritoneum always follows, never leaving an exposed crevice or depression unprotected. This embryonic process, most interesting and important, would take great space to do full justice, and therefore for want of the same will not be entered into in more detail at this time. In considering the peritoneum under this head, namely, the causes of its inflammation, the omentum and mesentery will be coincluded as merely folds of the same. From an anatomical point of view the peritoneum acts to the abdominal viscera and parietes just as a sheet acts toward a sleeping babe encasing the viscera and lining the walls just as the sheet covers and underlies the babe, thus protecting it. The *omentum* besides acting in a relatively medium protective scope, as compared with the parietal and visceral peritoneum, gives great re-enforcement within the abdominal cavity by mechanically and physically connecting the stomach with the other organs of this cavity, as also does the mesentery act in the same way toward the intestines and their suspension from the posterior wall. By such formation and placement it can be seen how readily this part of our anatomy enters into the formation of the recto-vaginal pouch, vesico-uterine pouch, bursaomentalis, various ligaments of the liver, foramen of Winslowi, and so on the enumeration might continue. Histologically the highest type of ciliated endothelium lining this great cavity gives the peritoneum its magnificent resisting power, and combined with its serous nature comes its well known adhesive ability. Taking into consideration all of these embyronic, histologic and anatomic conditions we will now endeavor to see from what points the peritoneum may become infected and how the infection may extend. As has been previously stated the two abdominal points most often infected are the appendix and gall-bladder. Naturally the appendix leads, as it is more openly situated and in closer apposition to direct contamination. The appendix is freely exposed to the onslaught of the colon bacillus, typhoid bacillus, tubercle bacillus, streptococcus, staphylococcus, etc.

Whether or not these organisms will always gain fertile ground and cause a magnitude of disturbance remains for the resisting power of the tissues to determine. If this little body does become greatly inflamed and swollen, and concretions form or have formed previously it remains only for a pus producing organism to get in its work and result in perforation, thus contaminating the adjacent pertoneum and resulting in peritonitis. Here is the great alley of entrance, and how far such an infection may extend shall be determined by the protective power in the adhesive ability of the peritoneum itself. Such

an infection could easily result in metastasis when the swaying, circulatory movements combined with the magnificent blood supply of this great serous cavity be taken into consideration. Secondly the gall-bladder plays its important part by way of an avenue. If this part of the anatomy become diseased the cause must come from the alimentary tract or the liver itself, barring external violence. Thus the same organisms that deal with the appendix would play a part here. If the gall-bladder be perforated by denudation of its wall by a stone the contamination of the peritoneum would immediately result, but excluding pus formation, the resulting peritonitis would not be as fulminative or severe considering the claimed antibacterial action of bile. If pus does form and the gall-bladder wall burst here would result a severe localized or general peritonitis depending upon the reactionary adhesive ability of the neighboring peritoneum. Next in order comes perforations of various parts of the alimentary tract excluding the one previously discussed, namely the appendix. Under this head would come perforations from typhoid ulcerations, perforations resulting from ulcers of the intestine with dysentery as the cause. Here the Amoebic variety would play the leading role having that peculiar serpiginous ulcer with its deep undermining edges and whether or not peritonitis was set up from this cause directly, later we might get it from the altogether too frequent complication of this disease, namely abscess of the liver, which occurs in about twenty per cent of the cases. Also the bacillary type of dysentery might be a direct cause, but not with the same frequency and not as dangerous indirectly because of the far less frequency of liver complication. Gastric or duodenal ulcer of the rapidly eroding type would also come under this head, especially the peptic form. From these various causes of alimentary perforations we can readily see how a local or general peritonitis would result with greater or less number of adhesions formed and how the resulting infection could readily be a very complicated and mixed one. As in dysentery the primary cause would be either the Amoeba Coli or the bacillus of Shiga depending upon the variety while the colon bacillus of Escherich, streptococus and staphylococcus might enter at the same time and get in its work just as it could mix the infection caused by the typhoid bacillus in a perforating typhoid ulcer. In the female we have extra organs to deal with as a pathway of infection. The uterus and its adnexia are invariably open to disease of some sort or another whether it be specific or otherwise. Gonorrhea wending its way from the vagina into the womb and then up one or both of the Fallopian tubes directly into the abdominal cavity. With such a free access is it not a wonder that infection by this source is not more frequent especially when self-incurred abortions are so numerous as they are to-day? With the severe toxemias as septicaemia resulting as they do from many cases of this character it is wonderful that we do not get many more cases of that severe, stampeding form of general peritonitis which brings death in the first few hours unless scientific interference comes to their aid and even then the mortality from this self-induced trouble is very high. Tubercular spondylitis would well fit in here as an important indirect cause of this trouble. The vertebrae becoming necrosed, break down and the resulting abscess bursts, the pus burrows in the direction of least resistance, aided by gravity, resulting in the well known psoas abscess. This coming as it does from the region most often involved by Pott's disease namely, the dorsal and lumbar sections of the vertebral column, burrows its way down under the sheaths of these two great muscles, the psoas magnus and parvus, reaching the iliac fossa and again bursting from some cause or another setting up a tubercular process within the abdominal cavity if it has not already reached this part by metastasis. Acute or chronic pancreatitis, whether it be a complication or sequela of gastric and duodenal ulcer or gall-

bladder trouble, if it be of the severe, resisting type would be in a very conspicuous place in putting forth its natural results as also would pyonephrosis, pyelitis and perinephritic abscess though entirely extra peritoneal, becoming secondary causes by the well known burrowing nature of pus when confined as it would be in or about the kidney surrounded by its mass of fat and areola tissue. Following these closely come empyaema of the necessitatis type, whether or not it result in sub-diaphragmatic abscess or direct burrowing. Renal lithiasis giving up a stone to its ureter the same perforating the wall of the latter as also might calculus in the urinary bladder perforate by denudation thus communicating with this great serous cavity. Malignancy in all of its forms involving the abdominal viscera or adjacent parts would by direct extension or meastisis cause a malignant peritonitis. Malaria and tropical disease, through the circulatory system, resulting in its pyaemic mode of spreading could easily affect this important visceral covering. So far nothing has been mentioned regarding the frequency of peritonitis from external violence of varying degrees, such as stab wounds of the lower back and abdomen, gun shot wounds, severe blows causing rupture of the spleen, etc., burns of varying degrees with their secondary influence upon the kidneys, duodenum and stomach giving indirect cause for peritonitis, or if rightly situated it may be a direct cause.

CONCLUSION.

It will be seen by the foregone drawn causes and results that the peritoneum is so constituted and situated that it lies in a direct or indirect path for infection from many causes and only by its histological make-up, anatomical formation and distribution, and functional ability to send forth its natural gluing secretion resulting in adhesions forming, that many times our anatomy is exempt from greater taxation by the usefulness of this great sheet barrack.

In treating any of these causes we should never forget how easily it may be for the peritoneum to become involved and our eyes should always be open to forestall such results if possible. Again also we must not forget that if any one or more of these causes does set up disease of the peritoneum that this same peritoneum is a gatling gun of defense in itself, and how many times it shuts off the progress of some dread disorder which if not walled off would invariably prove lethal.

REPORT OF A CASE OF ABDOMINAL ANEURISM TREATED BY WIRING.*

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The cure of aneurism affecting the larger blood vessels of the body is a question that has given much concern to medical men for many years. In attempting to formulate a rational treatment for this serious condition, surgeons have been particularly active, and by some it is classified as a distinctly surgical disease. A study of the literature, however, is not very encouraging, and, in the light of our present knowledge, it must be confessed that the rational treatment of this malady, either surgical or medical, has by no means been attained.

It is the purpose of this paper to place on record one case of aneurism of the abdominal aorta, treated by the insertion of a wire through which a galvanic current was passed after the wire had been introduced. At the same time attention is called to the previous similar operations, which, as collected from the literature, are twenty in number. A critical analysis of these twenty-one cases brings out several facts from which important conclusions may be deduced.

The case which I wish to report was a negro, 32 years of age, whose occupation was that of a Pullman car porter. He was referred to the surgical service of Dr. Geo. B. Johnston from the practice of Dr. E. A. Truman, Richmond, Va. The patient had enjoyed perfect health until June, 1907, and denied all history of lues. At that time he began to suffer with occasional attacks of diarrhœa, which have persisted up to the present time in spite of treatment. He now has from five to ten stools a day, which are watery, offensive, contain a slight amount of mucus and blood, but there is no tenesmus. Three months ago he began to suffer with severe pain in the region of the umbilicus, with frequent colicky exacerbations. This lasted for nearly a month but has not since returned. Following this he noted considerable throbbing in the abdomen. Physical examination showed a distinctly emaciated patient who was moderately anemic. The heart and lungs were clear throughout on percussion and auscultation. In the abdomen there was a visible prominence in the right hypochondrium. On palpation over this area there was a long rough systolic thrill, which on auscultation gave rise to a bruit that was so loud as to almost hurt the ears. The tumor appeared to be the size of a small cocoanut and was situated just above and to the right of the navel. There was very marked expansile pulsation. A distinct diastolic shock could be made out in addition to the systolic bruit. The abdomen was elsewhere negative. Both femoral pulses were distinctly felt and were synchronous in time. An examination of a specimen of the fresh stool showed that it was liquid with small yellow masses like milk curds and two small particles of dark red coagulated blood with a slight amount of mucus. Microscopical examination was negative for amebae and other parasites.

Patient was operated upon March 28, 1908, under ether anesthesia by the drop method. A median incision was made and exposed the tumor, which appeared to arise from the aorta just below the celiac axis. The tumor was

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distinctly sacculated and came off on the right side of the orta. A needle, covered with lacquer, was inserted into the sac with its point away from the aorta and through this eleven feet of silver wire was fed to form a coil. Following this the electric current was passed as follows:

10 milliamperes for 20 minutes.
20 milliamperes for 10 minutes.
30 milliamperes for 10 minutes.
40 milliamperes for about 5 minutes.

When this had been raised to 40 milliamperes the patient's condition suddenly changed, the pulse went up to 140 and it was necessary to give artificial respiration for several minutes. He gradually reacted, however, and the needle was removed without hemorrhage and the patient was put back to bed. Recovery was without incident.

The notes of a physical examination three weeks after operation showed, as we thought, a tumor of distinctly smaller size with less marked pulsation, and patient stated that the pain was very much less. One month after operation he left the hospital and two weeks after this he walked sixteen squares to present himself to the clinic. At this time he complained that the diarrhœa from which he suffered previous to operation was again giving him trouble. On account of this he was unable to go back to his work as Pullman car porter, but took up a lighter occupation. Three months after operation the diarrhoea increased in severity and he had repeated hemorrhage from the bowels and died forty-eight hours after the bleeding commenced. It was impossible to obtain a complete autopsy or to get the relatives to consent to our removing the tumor. A partial autopsy, made through an incision at the site of the original wound, showed the abdominal cavity entirely clean and free from any evidence of either hemorrhage or infection, and we believe that the sac ruptured into the bowel. On palpating the sac the coils of wire could be very distinctly felt through the thin walls and there was absolutely no evidence of any clot formation. Although before death we were satisfied that the tumor was reduced in size and that there was less pulsation, still at the autopsy there was no evidence to support such a view. The wall of the sac could be easily compressed between the fingers and would evidently have collapsed were it not for the framework of wire.

The first attempt to cure an aneurism by the insertion of a wire was made in 1864 by Dr. Moore of the Middlesex Hospital. He inserted seventy-eight feet of wire into a thoracic aneurism on the theory that the first indispensable condition for the cure of aneurism is to provide a means of eliciting fibrin from the blood, and a second like condition is to extend the surface within the sac on which the fibrin may be deposited. This method was not applied in the case of an abdominal aneurism until twenty years later, when Loreta, in 1884, introduced six feet of fine wire through a trochar. In this case there appears to have been an almost instant relief of symptoms and a progressive improvement for ten weeks succeeding operation. Thirteen weeks after the sac was wired, however, the patient suddenly died from rupture of the aorta into the abdominal cavity.

A distinct improvement over the early methods was the suggestion by Corradi of passing a galvanic current through the wire after it had been introduced. This was first applied by Corradi himself in the case of a large aneurism of the ascending aorta, April, 1879. It was not until 1892, however, that the Moore-Corradi method was employed for the cure of abdominal aneurism. This operation was performed by Stewart of Philadelphia.

SUMMARY.

For the reason that aneurism of the abdominal aorta has proved absolutely incurable by internal medication, it may be regarded as one

of those conditions in which a wide range of experimentation and trial methods is justified. Much has been hoped for in the Moore-Corradi method of treatment by wiring and electrolysis. Notwithstanding the fact that a technic of this operation has been perfected through most elaborate and painstaking studies and experiments, it would seem that those cases of aneurism of the abdominal aorta in which it has been applied have terminated in disappointment to the operator.

A critical study of the twenty-one cases thus for reported inevitably leads to the conclusion that surgery so far offers no certain relief for this malady. Of these twenty-one cases, the subsequent history of three is not recorded; in the remaining eighteen, death ensued in every case. The duration of life after operation in this series varied from one hour to nine months with an average duration of less than fifty days. Who knows that the length of life may not have been shortened instead of prolonged by this method of treatment? The operative technic that has developed for this condition would seem to be absolutely perfect and based upon sound surgical principles, but the fact remains that this method of treatment is disappointing and the last word has not yet been said concerning the surgical treatment of abdominal aneurism.

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THE STATUS OF CERTAIN POSTOPERATIVE PROCEDURES AMONG FIFTY PROMINENT AMERICAN SURGEONS.

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The new field of operative surgery opened to us by recent contributions of physiology and pathology, has produced many new and valuable methods of post-operative therapy.

Among the more noteworthy latter-day procedures we are especially interested in the elevated head and trunk posture first advocated by the late G. B. Fowler, the proctoclytic treatment of Murphy in cases of peritoneal infection, the administration of salines and certain drugs in the treatment of shock, and the valuable methods of drainage in pelvic conditions, based upon anatomical, physical and pathological laws.

The widely differing ideas expressed by numerous writers of the day, leaves one in doubt as to the general acceptance of these procedures. In an effort to determine the status of these procedures we have corresponded with fifty of the leading American surgeons, and the concensus of their opinions forms the *raison d'etre* of this paper.

FOWLER'S POSITION.

In the minds of many, Fowler's elevated head and trunk position in the post-operative treatment of infected peritoneal cases is one of the greatest contributions to American surgery.

The virtues accredited this procedure by various authors are:

1. The settling of peritoneal exudates into the pelvis favoring drainage.

2. The slow absorption of toxins from these exudates gravitated to the pelvic peritoneum.

3. The encapsulation of the exudates favored by the presence of the omentum, sigmoid and small intestines.

The surface of the peritoneum is but little less in area than the entire skin surface of the body, and is capable of absorbing from 3 to 8 per cent. of the body weight in an hour.

Muscatello has shown the upper portion of the peritoneum to possess the most rapid absorptive power, especially of formed and cellular elements.

Clark's (1) procedure of lowering the head and trunk to assist absorption by the upper peritoneal route, drains the toxic products into the lymphatics for final elimination by the excretory routes.

The opposite elevation of Fowler tends to relieve the peritoneal cavity of the toxic products by slow absorption. In the presence of drainage, Fowler's position produces elimination without absorption.

Fowler's position as to day employed in infected pelvic conditions consists in the elevation of the patient's head and trunk by raising the head of the bed, by use of pillows, swings, and the various bed seats. Coffey (2) has shown the necessity of higher elevation than is usually employed for true pelvic drainage.

Yates (3) has called attention to the increased respiratory effort in the elevated posture, and has shown that the suction action of the diaphragm promotes diffusion in the peritoneal cavity. This diffusion should be in large part prevented by supporting the patient without muscular effort on his part.

*Read before the Alabama State Medical Society, April 22, 1909.

Again Yates (3) has shown the increased diffusion and absorption by peristaltic action of the intestines and advises measures to allay this action.

Our correspondence, with fifty prominent leading surgeons, shows Fowler's position to be in use by 92 per cent. in the treatment of infected pelvic conditions.

Proctoclysis.—Another signal contribution to modern surgical post-operative treatment of infected peritoneal cases is the administration of large quantities of saline solution by the rectum. This was first prominently brought forward by J. B. Murphy, of Chicago.

The principles of proctoclysis are based upon our knowledge of physiologic and pathologic conditions of absorption and elimination of toxins. Murphy considers that if the immediate and overwhelming effect of a ptomain or bacterial intoxication can be overcome, inhibition of absorption, and elimination will prevent a fatal result.

Experience has demonstrated that as much as two pints of saline an hour may be absorbed when administered slowly per rectum, the reverse peristalsis as shown by Cannon, carrying the fluid back toward the cecum where absorption takes place.

According to Murphy, this procedure administers large quantities of fluid to the circulation, restores a fallen blood pressure, favors osmosis and elimination, dilutes the toxins, allays thirst and nausea, and increases peristalsis, and thus the expulsion of gases.

This eliminative treatment accomplishes the aim of Clark's head-down posture to aid in absorption. It accomplishes this with diluted toxins and restored blood pressure, without the great danger that Clark's procedure may incur in the sudden overwhelming of the patient through the rapidly absorbed toxins.

The increased lower intestinal peristalsis facilitating expulsion of gas, may compensate for the increased diffusion of toxins, by relieving pain and restlessness.

"The quantity administered depends on the severity of the case, the age of the patient and other considerations that will suggest themselves in the particular instance. The average, however, is eighteen pints in twenty-four hours; that is, a pint and a half every two hours. A quantity less than eight pints is, I believe, of little value. In a child of 11 as much as thirty pints have been administered in twenty-four hours without escape of fluid. The control of the flow should never be governed by knots in the tube, forceps clamped thereon, or small openings in the tip." (4)

"If the patient is getting to much solution, after the third or fourth day he will show a slight edema of the ankles, hands and even of the face. Then it should be discontinued until his circulatory equilibrium is restored, when the treatment may be repeated if indicated." (4)

The solution administered with an equal amount of calcium chloride is well given by means of a can or bag elevated from three to seven inches above the buttocks and maintained at 100 degrees. F.

The flow passes through a hard rubber or glass nozzle flexed at an obtruse angle two inches from its tip, and having several large openings to permit of the easy expulsion of gas backward into the can.

Various methods of maintaining constant temperature and constant flow are recommended. Simplicity of apparatus is recommended by Murphy.

Murphy has reported forty-seven cases of diffuse suppurative peritonitis treated in this manner with but two deaths.

Ninty-nine per cent. of the fifty surgeons corresponded with employ the general principles of Murphy's proctoclysis following operation in infected pelvic conditions.

Ninty-nine per cent. employ these principles in the post-operative treatment of shock.

Ninty-two per cent. employ these principles for the allaying of nausea and thirst after ether.

Proctoclysis in Conjunction with Fowler's Position.—It would seem that two such admirable procedures might well be combined. Ninety-two per cent. of these surgeons employ proctoclysis in conjunction with Fowler's position in the post-operative treatment of infected pelvic cases.

Employment of Certain Drugs in Shock.—Strychnine, adrenalin, alcohol, and digitalin are the drugs more generally mentioned as used in the treatment of shock in late years.

Crile has well defined surgical shock as a state of low blood pressure, due to functional impairment or exhaustion of the vasomotor center. This impairment, or exhaustion, is due to traumatism from operation or injury of sensitive tissue.

Clinical and experimental evidence tends to show that this fallen pressure is due to a vascular dilatation, although Porter and Malcom both state that there is a general constriction of the peripheral arterioles.

Treatment of this condition has for its aim the restoration of the fallen pressure, either by the mechanical restoration of pressure by large quantities of saline absorbed into the vascular system, or by some cardiac or central stimulation. Most of the effectual therapeutic agents undoubtedly effect central control, but evidence tends to show that central control is reciprocally aided by an increased nutrition following the mechanically restored pressure.

Strychnine.—Any improvement in cardiovascular tone following the administration of strychnine must be attributed to the constriction of the vessels, and the indication for its use would seem to be that of low pressure. The work of Crile and others has shown that in repeated hypodermic doses it has beneficial effects, especially in conjunction with saline solutions variously administered.

Digitalin.—This drug has more of a cardiac action and is of particular therapeutic value in certain cases in which venous congestion is the main disturbing factor. When the heart is dilated and there is insufficient systole, its action is almost specific, especially if the cardiac muscle has not undergone degeneration. It produces an increased output, and an increased velocity and blood pressure. In certain cases of shock complicated with cardiac disease, digitalin is preferred by certain authors.

Alcohol.—In the treatment of shock and other forms of sudden and severe depression of the heart and central nervous system, strong alcoholic preparations in the form of brandy and whiskey are often administered. "But the beneficial effect of alcohol in these cases has been questioned in recent years, and the belief that it is of little value is certainly more widely held at present than at any previous time." (Cushny.)

Adrenalin.—The action of this preparation is to produce an immediate and marked rise in the blood pressure, due chiefly to a marked contraction of the peripheral arterioles from direct action on the muscular coats, in part due to the increased efficiency of the cardiac contractions, perhaps partly to stimulation of the vasomotor center, although there seems to be no loss in its effectiveness in dogs after severing all central paths.

Although the rise of pressure is much greater and more rapid, the effect is more transient than that of digitalis. Its action is most effective when administered in conjunction with salt solution intravenously.

Of these four drugs, forty-six per cent. of these surgeons give strychnine as first choice, 14 per cent. prefer adrenalin, 12 per cent. prefer digitalin, 8 per cent. prefer alcohol.

Twenty-four per cent. never use digitalin.
Thirty per cent. never use strychnine.
Thirty-two per cent. never use adrenalin.
Forty-two per cent. never use alcohol.

An interesting fact elicited by our correspondence is the growing tendency to limit the use of drugs in favor of careful preoperative measures and post-operative postural and other physiological procedures.

Drainage in Pelvic Infection.—The well known slow absorptive power of the pelvic peritoneum, the presence of the omentum, sigmoid and small intestines favoring encapsulation, has led many authors to prefer drainage by the vaginal route where applicable, especially when combined with Fowler's position.

These same authors maintain that the contact of abdominal drains with the bladder, intestines, and omentum tend to produce infection and perforation of these organs and development of adhesions.

The possibilities of persistent sinus formation and hernia are less important objections voiced by these men in drainage by the abdominal route. Seventy per cent. of the surgeons corresponded with prefer the vaginal route, while 30 per cent. prefer abdominal drainage.

In Conclusion.—The popularity of Fowler's position is definitely shown in its employment by 92 per cent. of the fifty surgeons corresponded with.

Proctoclysis.—The use of the principles of this procedure by 99 per cent of these surgeons shows its universal acceptance as a therapeutic agent in the post-operative treatment of infected pelvic conditions.

Proctoclysis in Conjunction with Fowler's Position.—Ninty-two per cent. of these surgeons combine these two admirable procedures.

Drugs in Shock.—There is undoubtedly a marked variance of opinion as to the employment of stimulative drugs in the treatment of post-operative shock, and a growing tendency to physiological rather than drug therapy.

Drainage.—The fact that 70 per cent of these surgeons prefer vaginal drainage in infected pelvic cases gives the preponderance of opinion in favor of this procedure in the post-operative treatment of infected pelvic cases.

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2. J. A. M. A., March 16, 1907.

3. Surgery-Gyn. and Obst., November, 1908.

4. J. A. M. A., April 17, 1909.

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EDITORIAL

PHYSICIAN AND LABORATORY.

The effect of any valuable new discovery is immediately to create a class of enthusiastic followers among those who understand the merits of the discovery as far as they have been demonstrated, and who utilize every opportunity to broaden the scope of its application legitimately; and another class of skeptics who know nothing of the real merits or methods involved, and have no confidence in the plaudits of sanguine believers. Then from the excess of confidence the one group magnifies, while the other minifies the merits in the case. And both are wrong; neither is keeping within the spirit of true scientific investigation, for which the words of Paul, "prove all things, hold fast to that which is good," would make an excellent motto. The laboratory has had tacitly and virtually, if not avowedly and openly, arrayed against it in many directions a spirit of antagonism and professed skepticism. Physicians have thought that the man with the microscope and the culture tube has come to displace the study of symptoms and signs that have stood him in so good stead so many hundreds of times before there was a laboratory or a practical pathologist or bacteriologist. He knows typhoid fever can be recognized without a Widal or a diazo-reaction; that tuberculosis can be diagnosed and was diagnosed without, and before there was knowledge of Koch's bacillus; and admits to his own contemplation the silly question, "What's the use then of the laboratory?"

Again, there are pathologists who increase such feeling as the above, by insisting that the laboratory has come to do away with the established laws of diagnosis, and that if the Klebs-Loeffler bacillus is found from a mouth, then no matter what the clinical findings may be the patient must have diphtheria. These both are laboring under a misconception that the limitations of his own field are much less than those of the other. In truth, both are limited in many respects, as he knows best who, having failed to conclude what the nature of the malady is from symptoms and signs and history, has had the pathologist give a report in contradiction of a tentative diagnosis, yet offering nothing conclusive in another direction.

The pathologist enables the clinician to know the value of clinical evidence better than he possibly could know it otherwise, to make certain diagnosis earlier than could be done otherwise, and certain others that he could not make at all. Consider tumors of the breast. There is a small nodule present, painless, showing every indication of benignity. One advises waiting, for what it staggers the imagination to reveal. Another advises removal, microscopic examination and a settling of the question of fact as to what the nature of the growth is, what the rational treatment is, and in case of malignancy a very considerable increase in the prognosis of ultimate recovery.

It is sometimes said that the pathologist should not be allowed to know the symptoms or history of the case from which his specimen is derived. That can only mean that the pathologist is dishonest or that the clinician is more capable of passing on clinical and pathological evidence, than the consulting pathologist is. One might as well refuse to give the whole facts to a bedside consultant on the ground that it would prejudice him. After all the man in the laboratory is only a specialized

consultant and will render us better service, and be better able to interpret his findings if he knew symptoms and history, or if he could see the patient, than otherwise. The two must go hand in hand, each must trust the other, and the practical man, if he would keep abreast of his fellows, must continue to patronize the laboratory with increasing frequency.

W. A. B.

BEWARE OF SYPHILIS.

Every individual of accountability should beware of the possibility of innocent infection with syphilis. In so many cases it is not a merited disease, and for this reason alone the liability of infection with syphilis should be taught and guarded against with the same degree of energy as we attempt to prevent tuberculosis, scarlet fever and other contagious diseases.

Physicians well know the cause, the modes of transmission, the individual, hereditary and social dangers of this modern plague, and why should the great mass of humanity remain ignorant of the same facts and helpless as far as self protection is concerned. It would be a very difficult question to settle as to which affects the human race the more—syphilis or tuberculosis, yet a most strenuous crusade is made against the latter and the former escapes all because it is regarded on first thought as only a venereal disease. When the innocent contract it, it ceases to be only venereal and should receive before the public the same attention to prevent infection as any other disease. No longer than yesterday I saw a mother infected with syphilis from her own infant, who had contracted it from a nurse. Many such cases are reported. Seven innocent persons of one family have been infected from one wet nurse. Out of 887 women reported by Fournier in private practice, forty-five were innocent.

The frequency of chancres show the extra-genital to be nine per cent. to ten per cent., but as a matter of fact some of these are venereal.

A clinician in the London Hospital, White Chapel, remarked to me one day concerning the question of syphilis, that he had recently observed a very interesting fact. On receipt of the news of the capture or fall of Mafeking in South Africa, during the Boer war, all London, particularly on the East-side, went into joyous rioting—men and women, hugging and kissing each other as they met on the streets. In due time as a result of this a crop of extra-genital chancres appeared in the clinic. The bulk of this infection was innocent.

Syphilis is not as frequent in this country, I believe, as it is in some of the continental centers, but it is frequent enough for the layman to be warned against innocent infection. It is probable that thirteen per cent. of the male population of Paris is infected with syphilis.

A practical solution of the question then comes. How is the condition to be improved?

1. In the elementary works on hygiene, along with the other infectious diseases, a discussion on innocent infection with syphilis should appear. The question could be presented in a straightforward manner without embarrassing any one

2. All academic and college male students should receive instruction in the form of lectures on the subject. These students, later becoming heads of families, slowly, but surely, disseminate this information.

All people cannot be reached, but many may be with great benefit. All such questions must be regarded from a practical standpoint, and in an endeavor to accomplish one's purpose, new avenues of progress will open up before him. Only two ways of instructions have been here presented; others would be discovered when an effort is made to carry out the work. The movement should be inaugurated by medical societies and health organizations.

J. M. K.

ABSTRACTS OF CURRENT LITERATURE

MEDICINE

ADVERTISING BY PHYSICIANS.

J. Grindon, St. Louis (*Journal A. M. A.*, May 29), says that practically all physicians advertise; the real question is, what is proper in the way of advertising and what is not. He reviews the letter of the law in the codes of ethics, and divides advertisements, or notices to the public, into five classes: 1. Those which are uncondemned, such as modest signs and cards with simply the doctor's name and hours, not promiscuously distributed. 2. Those not condemned by the Principles of Ethics and in use in some communities, but avoided by some. They consist of simple business cards inserted in lay publications, and are now virtually obsolete among English-speaking metropolitan physicians. 3. Those methods not specifically condemned by the Principles of Ethics, but manifestly in contravention to its spirit, and therefore universally deprecated by worthy physicians. They are included in the general condemnation "of the other methods of charlatans." Such are the distribution of cards on the street, the use of showy signs, and the distribution of medical reprints to laymen or prospective patients. 4. Advertisements veiled in form, oftenest consisting of accounts of cures, operations, alleged discoveries, etc., ostensibly written by reporters, but really furnished by the physician himself, either verbatim or in substance. These are condemned as the most vicious of all kinds of advertisements, and in this connection Grindon discusses at some length the subject of contributions by physicians on medical subjects to the lay press. These are usually one of three kinds: 1. Those giving advice. If the advice given is such as every patient would easily obtain from his regular adviser, it is open to grave suspicion, while, on the other hand, if it is of a sort that will be of real value to the public and such as the reader would not likely obtain from his personal adviser, it might be altogether commendable. This is especially the case if the contribution is from one who can speak with authority and who is above suspicion of sordid motives. The second class of such contributions, the purely scientific ones, are unobjectionable unless so written as to direct attention to the writer rather than to the subject-matter. Articles falling within the third class, namely, those discussing the diagnosis or treatment of cases which have become notorious or which affect eminent persons, will, as a rule, deserve the censure of the judicious. The discussion, if proper at all, should be confined to the medical journals. Expressed opinon as to the mental condition of persons accused of crimes come in the same class, and still another debatable form of publicity is that of the ante-mortem biographic notice, often with a portrait, in bound collections of sketches of distinguished citizens, or in the Sunday issues of city papers. If its appearance was contingent on the payment of a fee, direct or indirect, its unworthy character is not debatable. 5. Last among the classes of advertisements by physicians using the term loosely, are the flagrant, undisguised, paid-for advertisements, and these are not discussed. The term advertisement, Grindon says, has been used by him in a rather restricted sense, namely, that of reading matter of some sort, addressed to the public. There are other ways of advertising but he did not wish to make the subject too exten-

sive. He has also left untouched the matter of advertisements of the physician's learning and skill, addressed to and intended for the profession. The subject is a difficult one but the medical profession is better able to take care of itself than is the laity. To sum up, he concludes that any notice or advertisement of any kind sent out by a physician seeking to obtain an unfair advantage for himself, or that compromises his dignity, is an objectionable advertisement, and the greater the pains taken to conceal its true character the worse it is.

ANGINA PECTORIS.

Referring first to a former paper published 11 years ago on painless angina pectoris due to disease of the right ventricle, W. W. Kerr, San Francisco (*Journal, A. M. A.*, May 29), reports five cases of painless angina which illustrate the frequency with which this condition may occur in connection with disease of the right side of the heart. He does not maintain that it is limited to cases in which the right ventricle alone is affected, since it may occur when both ventricles are diseased, but the presence of the symptom signifies that the right ventricle is seriously diseased as well as the left. In all the cases reported, three features were noted especially: (1) There were changes in the wall of the right ventricle; (2) during the attack the pulse was small and feeble; (3) after the attack was over and in the intervals the radial pulse was of good quality. These he uses to explain this condition. The muscle being already deficient in power any sudden or unusual call on it might produce the symptom. When the right ventricle only is affected we can easily understand why the radial pulse improves so rapidly when the seizure is over, but when the cardiac oppression and respiratory distress is simply intercurrent on the symptoms of general cardiac disturbance, such improvement is not to be expected. According to Kerr, painless angina is more common than one would suppose from the infrequency with which it is reported, but probably it is not always recognized and the patient's symptoms are attributed to hysteria or some reflex disturbance. When they occur with a dilated right heart or distinctly atheromatous changes, the diagnosis is easy. But when physical signs are absent it is often difficult to give a positive opinion. If between the attacks the patient has a constant feeling of weight or distress over the precordia and has a tendency to take occasional deep inspirations, there is a strong probability that the right ventricle is affected and this is made certain if the symptoms are invariably produced or aggravated by exertion. This form of angina is altogether different from the painful type and in many cases requires entirely different treatment. In all probability it is due to some local obstruction in the coronary circulation, which may be organic, spasmodic, or a combination of both. The fact that the radial pulse varies in different cases, the tension being sometimes high, sometimes low, indicates that the attacks cannot be invariably attributed to increased resistance in the peripheral circulation and they cannot be explained moreover solely by the condition of the cardiac muscle itself. The causes of the obstruction are not the same in every case, and local vasomotor spasm is nothing new in medicine; spasmodic contraction may occur in the finger, in the body surface, or even in the vessels of the brain, and it is perfectly possible that there might be local obstruction from a minute embolus or sclerosis of a coronary branch. The changes in peripheral blood pressure are, as Kerr believes, more coincidences than causes, and degeneration of the cardiac muscle may be the consequence of the impaired coronary supply but not the cause of the seizures. The treatment of the two forms of angina will be entirely different during the seizures, but, as a rule, identical in the intervals. Since cardiac asthma is due to failure of the right ventricle, rapidly acting stimulants, such as caffiene, cam-

phor, or strophanthus, will be indicated for the attack; while angina pectoris on account of the spasm will call for vasodilators such as amyl nitrite or nitro-glycerin. It is not infrequent for the subject of coronary spasm to suffer also from a weak heart and then a combination of heart stimulant and antispasmodic is demanded. Between the attacks, the treatment is the same as that recommended in cases of chronic myocarditis and arteriosclerosis. A well-regulated diet is of the utmost importance; avoidance of mental and physical strain, and exercise, carefully adapted to the individual, are also advised. Arsenic and the prolonged use of iodids in small doses will often be found to have a beneficial effect on both cardiac muscle and the blood vessels. Lastly, we should not neglect the elimination of toxic substances resulting from physiologic activity or food metabolism.

RESISTANCE TO CANCER.

H. Gideon Wells, Chicago (*Journal A. M.A.* May 29), notes the still unsatisfactory results in the surgery of cancer, and asks if we have any right to expect enough better results to preclude the desire to find some other means than surgery for its relief. He admits that there seem to be at present some facts in the biology of tumor growth that indicate a possibility of success in this search. To obtain a specific therapy for an infectious disease two methods are available. We may either stumble on a cure empirically or we may study the way the body defends itself and endeavor to assist or intensify this natural method. Perhaps we may consider Ehrlich's method of therapeutics, by more or less empiric methods obtaining something that has a favorable influence on an infection, and then enhancing this influence by adding various and sundry radicles to the original more or less hopeful appearing substance. The most logical method at present, Wells thinks, is to learn how the body cures itself when natural recovery takes place and then, if possible, to enhance this attempt. We may start with the assumption that no malignant growth ever succeeds in growing to the extent to which its natural proliferative power entitles it. One of the commonest occurrences in malignant tumors is necrosis or less extreme degenerative process, and such tumors are influenced by the state of health or vigor of their host. Their progress is generally much less rapid in the old than in the young. The fact that the rate of growth of cancer is in direct proportion to the nourishment and vitality of the patient, quite the opposite from what occurs in infectious diseases, would seem to make for the non-parasitic nature of such growths. Of greater interest to us are the instances in which malignant tumors show healing changes, independent of such conditions, which may appear as retardation of growth or recurrence after removal retrogressions of secondary growths after removal of the primary tumor, of disappearance of portions of tumor tissue after an incomplete palliative operation or even spontaneous healing of a primary tumor without operative intervention. Total healing without operation and without recurrence is practically unknown, but this does not necessarily mean that it may not occasionally occur. Two cases are referred to which suggest that when cancer follows chronic trauma, the defensive mechanism of the body may be able, in the early stages to overcome the cancerous proliferation if only the original irritant is removed. A number of other cases are reported from various authorities of spontaneous healing of cancer, but the evidence concerning the healing of portions of carcinomas left after operations is far better than of cases in which healing has occurred when no operation has been done. A large part of the paper is taken up with references to cases of these forms of healing, and he reproduces the notes of Dr. Alexander Harvey of a case which he has

had a chance to study, in which the secondary growths disappeared after the removal of the primary one, and the autopsy revealed the scars. The patient died, with symptoms resembling uremic coma, very probably from a cerebral lesion, after eighteen months of apparent health succeeding the operation. The examination of the head itself was not permitted. Other similar or somewhat similar cases of other surgeons are also referred to. Just how the removal of the primary growth thus influences the metastases is hard to say, but Wells suggests, as possible, a sort of autoimmunization from cancer substance forced into the circulation by the operative procedure. As supporting this view he adduces a suggestive case described by Mackey. The condtions under which metastases are formed is also another source of evidence of the resistance of the body to cancer. The least resistant organs are the ones that are affected. Just now our chief hope lies in experimental work with transplanted tumors in animals, in which, besides a natural congenital immunity to some extent, there is sometimes produced a varying degree of acquired immunity, both active and passive, the first more successfully than the last. There is, however, some evidence that the blood of animals spontaneously recovering from tumors may render animals more or less resistant and even cause healing of tumors in inoculated animals. All these accumulated observations during the few recent years of cancer research give much hope that eventually we may do something for the cancer patient besides radical operation.

NOTES ON RECENT THERAPY.

Hirschfeld (1) emphasizes the importance for therapy, in diseases of the blood and the blood forming organs, of our present views as to the regeneration of the blood in normal and pathological conditions. At present, for example, there is no solid ground for the theory that increase in the size of the liver and the spleen, and multiplication of the leucocytes, in myelogenous leukemia, should be considered as reparative processes, and the same is true for multiplication of lymphocytes in the lymphatic form of leukemia. Large lymph node tumors, which do not yield to other measures, may properly be the subject of surgical treatment, unless the tendency to hemorrhage is strong. In pernicious anemia we consider the changes in the bone marrow as an effort at repair, and suppose that the newly formed cells are subjected to injurious influences after they have reached the general circulation. But if we regard the marrow as the site of the pathological process, the place where the injurious influences act, then it is reasonable to treat the case by the X-ray applied to the bones. This may affect the toxins there advantageously, but, on the other hand, there is a risk of preventing the regeneration of blood cells. The increase in the size of the liver should not be combated, for this is almost certainly reparative, both the liver and the spleen tending to revert to their embryonic function of blood cell formation.

The action of the X-ray upon the blood and the bone marrow has been studied by Aubertin and Beaujard (2). The effect upon lymphoid tissue is well enough understood, but what occurs in the bone marrow and the blood cells is still unknown, chiefly for want of a method of determining the dosage. After exposing animals to the X-ray treatment of moderate therapeutic dosage (9 guinea pigs), and killing them at periods of two hours to twenty-three days afterward, they determined that the effect of the rays is very different according as it is applied to lymphoid tissue or the marrow. Single treatments caused long persistent blood changes, at first a transitory increase in the leucocytes and then a leucopenia interrupted by periods of leucocytosis. The changes were not due to increased destruction of white cells in the spleen, and they occur in spite of hyperlasia in the marrow. Many de-

generated polynuclears were seen in all the smears, but sometimes the eosinophiles were increased.

While the spleen is the main graveyard of blood cells, the opinion is gaining ground that in pernicious anemia there is a destruction of the cells while they circulate in the vessels, from the action of toxic substances which almost always are derived from the alimentary tract; this is quite clear in cases due to the presence of bothriocephalus, for the parasite furnishes a toxic lecithid, but in other cases there is very frequently an atrophic gastritis with achylia, or there may be a cancerous growth; resorption of toxic lecithids or lipoids, which closely resemble the hemolytic lecithid of cobra venom, which will produce anemia in the experimental animal, explains not only the blood changes but also the well established fact that thoro cleansing of the alimentary tract is often sufficient to bring about improvement, even cure. Reicher finds that feeding cholesterin will either reduce or wholly prevent the formation of such toxins. He gives a three per cent solution of cholesterin in olive oil, and in three cases observed distinct improvement; a fourth did not respond, but was improved by atoxyl. He advises the cholesterin treatment, not only in pernicious anemia but also in paroxysmal hemoglobinurio and eclampsia. (3)

Martelli (4) has published a study of the comparative action of ether and chloroform upon the oxygen of the blood, both in vitro and upon dogs, and finds that in the test tube the action of chloroform is more pronounced and rapid, increasing the free oxygen in the blood by destruction of the red cells, but in the circulating blood of the living animal chloroform decreases the oxygen while ether increases it. This may have some practical importance for surgical anesthesia in the light of Zurbesth's recent paper (5). It has long been known in the laboratory that if the extremities of a rabbit are tied off and choloroform administered, far less of the anesthetic is required to produce profound narcosis, the animal wakes more rapidly and there are fewer secondary effects. He has made practical application of this fact in anesthetizing human subjects, and finds not only that less anesthetic is needed and recovery from it is more rapid, but that in case of need, the blood stored up in the thighs and legs, rich in CO_2, may be used to dilute the chloroform circulating in the rest of the blood. This is certainly a quicker and safer method of resuscitating the patient, that is, simply releasing the thigh ligatures, than saline or direct transfusion.

Mendel (6) has employed medication directly into the veins in many cases with good results, asserting that the fear of this procedure on the part of many physicians is not justified, for if carefully done there is no more danger than with hypodermics and the effects last longer, contrary to what is generally believed. The drugs used must not tend to cause coagulation of the blood or destruction of the cells or interference with the function of the lining endothelia. Hetol has long been given intravenously in tuberculosis, and while it may not do much good it certainly has not proved harmful, and Crede has used his colloid silver in the same way. Atoxyl may be used in as high a strength as 15 per cent. in various blood conditions, enlargements of the lymph nodes, skin diseases, Grave's disease and pseudoleukemia. In tuberculosis the combination of tuberculin and arsenic is often of value. Sodium salicylate, 20 per cent with caffein, is valuable in rheumatism without fever. Digitalone and digalen often are irritant and strophanthin may have bad secondary effects intravenously. Adrenalin salt solution, in the proportion of one liter of physiological salt solution with 8 minims of 1 per cent. adrenalin, has proved a life saver in loss of cardiac power and falling blood pressure in septic processes, and quinine has been of use in syphilis, though potassium iodid and atoxyl are not. In hemoptysis Vanderhelden uses 3 to 5 c. c.

of 10 per cent sodium chlorid solution, which increases the coagulability of the blood.

Flesch (7) advocates the intravenous administration of strophanttin in degeneration of the myocardium, claiming a prompt effect when other cardiacs and diuretics fail. It is essential to introduce it accurately into the vein, for improperly given it causes much local pain and the constitutional effect may not develop. He gives 1 mg. and waits two or three days before repeating it.

Liebermeister (8) formulates the indications for intravenous use of strophanthin in this way; absolute indications are serious heart and kidney conditions where immediate aid is required, relative indications include conditions where digitalis is not tolerated by the stomach or is without effect, and where reliable preparations of digitalis cannot be obtained and yet a digitalis effect is demanded; in the first case he advises from 0.7 mg. to 1 mg., and in the second from 0.5 to 0.7 mg. Cumulative and toxic effects are avoided by giving not over 1.5 mg. in 48 hours, and not within four days after digitalis. Such intravenous use of strophanthin is well supplemented by theocin, diuretin or caffein by the mouth. Bradycardia is a contraindication. Hypodermic doses of strophanthin are liable to cause either abscesses or necrosis.

Strophanthin is given by Henzing (9) in still another way. He calls attention to the absorbing power of the air passages as a neglected route for medication, and instances two cases of weak heart which responded remarkably to strophanthin inhalations.

The organic preparations of iron were introduced by Bunge, and Schmiedeberger obtained one from the livers of swine and then made it synthetically, and this has been introduced under the name ferratin. Two late combinations of this with iodin and arsenic are known as iodo-ferratose and arsenic-ferratose, and they have proved particularly useful in anemia due to malaria and tuberculosis. Contrary to the general opinion that iron is not indicated in tuberculosis, Apostolides (10) has employed both these combinations in the early stages with good results, and Moritz has had the same experience. The arsenic ferratose has a beneficial effect in the obstinate eczemas which occur in chlorosis and other anemias. Hemæus (11) employs arsenic ferratose in children with tuberculosis and chorea, giving a tablet after meals and keeping the patient in bed from four to six weeks. The hemoglobin is increased, the entire blood picture improves, the appetite is better and there are no disturbances of digestion or irritative symptoms.

A valuable addition to the serum treatment of diphtheria is the use of a spray of pyocyanase. Gross and Ban (12) employ this spray from two to six times daily and state that the membrane loosens more rapidly than with serum alone, the fetor disappears and there is rapid improvement in the general condition. Danielewicz (13) reports nine cases of severe angina in eight of which the membrane disappeared by the second day, the temperature was normal by the third day, and in two cases phlegmon of the tonsils was cured without operation or ill effects; he advises its use every two hours.

Among the specific preparations for the treatment of tuberculosis, probably the best is purified tuberculin, tuberculinum purum, made from bacilli of human origin with all fats, waxes and other substances extracted. Gabrilowitsch (14) claims that larger doses may be used and the increase in the dose more rapidly pushed, and that it seldom causes reactions. With circumscribed lung foci about twenty injections are sufficient. At first there is an apparent aggravation of the local process and then improvement is rapid. In his material the bacilli disappeared from the sputa in 50 per cent, rales cleared up in 75 per cent, the temperature became normal during treatment in 31 per cent. and after treatment in 62 per cent, the patients increased in weight in 96 per cent, the gain varying from one to six kilos.

The dose varies with the prevailing conditions, but from 0.01 mg. at the beginning it may be pushed to 200 mg.

Freund (15) has employed the X-ray with good results in tubercular osteoarthritis, especially of the smaller joints, claiming 55 per cent of cures and 22 per cent improved. He says that a marked erythema must be produced and keeps up the treatment for some time even after apparent healing.

Among old friends in a new form may be mentioned pantopon, a study of which has lately been published by Sahli (16). This represents the entire alkaloidal strength of opium as an acid tartaric acid salt, and contains 89.77 per cent of total alkaloids as compared with a total for HCl salts of 90.0 per cent. It includes narcotin, but since a simple watery solution becomes opaque from precipitation of the narcotin, it is better to make a solution with glycerin, 25 parts to 75 parts of water, which keeps well. One gram is equivalent to 5 gm. opium, or 0.5 gm. morphine with 0.4 gm. of other alkaloids. The salt is brown and makes a brownish solution, faintly acid to litmus, neutral to congo, it may be sterilized by boiling without change and injections are painless. For ordinary pain and dyspnea 0.02 gm. usually suffices, best given in two per cent solution, but for delirium tremens twice this dose is required. Internally it may be given in pills of 1-2 centigrams, and it is not more constipating than morphine. So far all reports of the use of pantopon are favorable.

Among the best of the newer hypnotics is bromural, a mono-brom-iso-valerianate of urea. It is not injurious even in high dosage, produces sleep remarkably like the physiological, undisturbed by dreams, and with no unpleasant sensations on waking. It is not so serviceable during acute infections, but is particularly valuable in convalescence. It relieves moderate pain, not severe and lancinating seizures, quiets epilepsy and mental excitement, gives good results in nervous insomnia, is almost without narcotic action and free from cumulative effects, as pointed out by Remy (17). Grendi (18) asserts that it does not cause bromism on long continued use, and produces no change in the blood pressure, the composition of the blood, or metabolic processes. His smallest dose was 0.06 gm., and his largest 1.20 gm. He also emphasizes the physiological sleep and the absence of ill effects in single or continued dosage. Ubaldo (19) considers bromural better than the bromides for nervous excitement and insomnia, giving it in 0.3 gm. to 0.6 gm. doses, and for nursing babies in 0.1 gm., and he also observes that it has some effect in controlling excessive sweating.

One of the great therapeutic needs is a systemic cathartic, as efficacious in its way as apomorphin in causing emesis. Nicolini (20) has been studying this question, and reports a series of drugs which cause purging when injected hypodermatically. One of the most powerful of these is apocodein chlorid, in doses of 0.4 gm; a similar effect is produced by aloin, 4-8 centigrams of a 10 per cent. solution, cathartinic acid from senna, and podophyllotoxin from podophyllum, and eumydrin. While no one of these answers all requirements, yet the author's experiments demonstrated the local and general safety of their employment, and led him to hope that others may aid in the search for the desired drug.

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SURGERY

PITFALLS IN URINARY DIAGNOSIS.

This was the subject taken up by Dr. Bransford Lewis, of St. Louis, in the annual address before the Urologic Section of the Ohio State Medical Society, at Cincinnati, May 6, 1909. The author first called attention to enthralling interest of diagnosis, as connected with urinary affections, and its supreme importance, as compared with other features of the study and practice. Shortcomings in diagnosis frequently allow human beings to suffer for years that might, with diagnosis made clear, be healthy and useful citizens all of that time. Cases were cited in illustration. They also illustrated a habit to which some of the profession were addicted, that is skipping a real diagnosis entirely and jumping, pellmell, into the treatment, so-called, of a case; treatment which consists of giving medicines for the urinary symptoms presenting; which, if effective at all accomplishes the greatest harm by palliating and masking the evidences being offered by nature as signals of distress, that are the most valuable means possible for directing attention to the afflicted organ. The "beautiful specimens" of dilated ureters, sacculated, destroyed kidneys should be looked upon as post mortem monuments of such exalted ignominy. They are usually the result of the withholding of surgery through total disregard of diagnosis.

It was conceded that this was partly due to the relative inaccessibility of the urinary organs, as compared with the others of the body. But, aside from the fact that obstacles do not justify lax endeavor in medical work, it was pointed out that the means for investigating precisely and comprehensively the whole urinary tract were multifarious, exact and reliable; and the responsibility of having them used was assumed by every physician who accepted a patient for treatment, whether he himself were capable of using them or not.

The relative importance of the several features upon which a diagnosis must rest, the history, symptomatology, semeiology, physical examination, etc., were taken up and compared, to the distinct advantage of physical examination, for the development of accurate diagnosis. The pitfalls of diagnosis were considered as they related to the several parts of the tract as follows: A., for the urethra; B, Prostrate; C., Seminal vesicles; D., Bladder; E., Ureters; F., Kidneys. The individual steps of physical examination, as advised by the author, were recounted and explained.

Among the special subjects considered were: The several features requisite for a diagnosis of urethritis; the sins of omission and commission with respect to urethral stricture, and how to avoid them; the several requisites for diagnosis of prostatic obstruction and how to attain them by means of the definite steps advised; those relating to seminal vesiculitis, to bladder stone; to infections of the upper urinary tract. The author expressed his entire lack of confidence in staining methods as a mode of differentiating between smegma and tubercle bacilli, and indicated his idea of the best mode of distinguishing between them: that of excluding smegma bacilli altogether, in obtaining the specimen.

Cystoscopy and ureteral catheterization, their successes and their shortcomings, were given due consideration. Direct issue was taken with a number of the teachings on these subjects. The duty of the practitioner in the presence of hematuria, was considered, the conclusion reached being quite different from that as ordinarily understood. Probably one of the most interesting and practical parts of the address was that relating to the renal and ureteral calculi, the X-ray, and ureteral catheterization, under which heading the advantages and disadvantages of the several modes for attaining diagnosis were compared and the fallacies of each revealed. None were infallible, and none lacking in merit, and all, therefore, were to be employed and given due credit. Cases of mistaken diagnoses, in which the appendix had been removed under the belief that it was the malefactor, when in reality the trouble lay in the right kidney or ureter, were cited; others in which ureteral calculus was diagnosed, reliance being placed on the findings of the X-ray alone, only to be found wanting at the time of operation, were mentioned. The fallacies to which catheterization, taken alone and unsupported, might lead, were indicated. The proper means of avoiding these several pitfalls were given.

The final conclusion of the author was that if any one lesson were contained in the paper it was the necessity of subjecting to the scrutiny of direct, methodic, scientific investigation rather than futile analysis of symptoms, all obscure or difficult urinary cases; together with the recognition and avoidance of the numerous pitfalls that lay in the path of the unwary in this field of work. W. D. H.

BLOOD TRANSFUSION.

R. T. Frank and G. Baehr, New York (*Journal A. M. A.*, May 29), published the results of further experiments with the use of a vascular bridge or link composed of a fresh animal blood vessel, first described by them some months ago (*New York Med. Jour.*, Nov. 28, 1908.) They mention the difficulties of other methods and enumerate as the advantages afforded by the use of the bridge: (1) A sufficient length of vessel is obtained without extensive dissection of the artery of the donor or the vein of the recipient; (2) the link as now prepared by them has lost some of its elasticity, and is well-stretched, so as to afford an unobstructed lumen within the cannulæ, and a technic familiar to every surgeon (from its similarity to that used in intravenous infusion). The links are prepared by cuffing dogs' carotids at both ends over Crile's tubes, stretching them on a wire frame and fixing them for twenty-four hours in a 2 per cent. solution of formalin. The formalin is removed by two changes of sterile salt solution (thirty to sixty minutes each), and the prepared pieces, or links, as they are called, are permanently preserved in paraffin oil. Full details of the method of preparing these links are given, also of the technic, which closely resembles that so familiar in intravenous saline infusion, the infusion cannula being represented by the cuffed link. Tests were also made of the sterility, some of them rather severe, but no growth, even when infected with *Bacillus*

antharcoides, occurred after the tubes had been immersed in 2 per cent. formalin over ten hours. Out of twenty-six experimental transfusions performed by means of these prepared links, but one failed, and this was due to the kinking of the vessel during its preservation. These cases are tabulated. The authors say that, as far as can be predicted, the use of these links affords a simpler and easier method of transfusion than those hitherto described, and they hope that it may soon be tried on the human subject. The article is illustrated.

POSTOPERATIVE ILEUS.

W. H. Wathen, Louisville, Ky. (*Journal A. M. A.,* June 5), defines ileus as the operative or postoperative paralytic obstruction of the bowel, and says that the word "ileus" should be eliminated from surgical nomenclature. The primary paralytic form of obstruction may be caused (1) by violent inhibitory impulses transmitted to the muscle walls of the intestine from the central nervous system by the splanchnic nerve through the sympathetics; (2) by impairment or destruction of the nervous and muscular energy of the intestines by the poisonous action of bacterial enzymes from the intestines or peritoneal cavity on the nerves or muscles or bowel walls or from traumatism; or (3) by the combined action of both. The mechanical preoperative and postoperative intestinal obstruction may be caused by adhesions, constricting bands, volvulus, intussusceptions, hernia, etc., and, if not relieved promptly, the bowel above the obstruction becomes dilated then paralytic and the ileus can not then be distinguished from the primary paralytic form. He explains in detail the anatomy, physiology, motility, and bacteriology of the intestinal tract, and explains normal and abnormal peristalsis, while shock may have an influence in most cases of severe or fatal paralytic obstruction, this is the result of and is associated with the absorption of bacterial toxic products from the bowel of peritoneal cavity into the intestinal walls and tissues of the body. This is shown by the fact that when we remove the obstruction the patient may collapse from the rapid absorption by the comparatively healthy bowel below, of the toxic substances, the epithelial resistance being quickly impaired. We can not often decide when an operation is necessary until it is too late to do good, but in such cases as can be diagnosed, the obstructing cause, whatever it be, should be promptly removed with as little delay or rough handling of the intestine as possible. In some cases we shall get better results by relieving the distended bowel of its contents by enterotomy or even enterostomy, and a subsequent operation can be performed to remove the obstruction and restore normal conditions. In operations for mechanical obstruction it may be better not to enter the abdomen through the original incision, but to select a point where the obstruction can be reached and removed with the least possible exposure and injury to the viscera, and he gives some special directions on this point. In the absence, however, of any evidence of the seat of the obstruction it is better to enter the abdomen in the median line below the umbilicus. There is no department of surgery for which a knowledge of the embryology, anatomy, physiology, bacteriology, pathology, diagnosis, and surgical technic is needed more than for this, and in addition the surgeon should be a surgical mechanic. In true paralytic postoperative obstruction without peritonitis, surgery is contraindicated, and the treatment should be preventive rather than curative. We may sometimes have a recovery of an apparently severe case without surgical treatment, but in other cases a severe toxemia or general peritonitis may result, resistant to all treatment. Purgation is contraindicated, and neither food nor liquid should be given by the stomach. The general belief that we

should give remedies in any form to establish intestinal peristalsis has no scientific basis, and it is positively contraindicated in cases in which there is peritonitis, inflammation of intestinal walls, or injury to the nerve plexus or muscles of the bowels, and it might cause death. Such medication could only be useful when the cause of the obstruction is in the inhibitory action of the splanchnics with little injury to the nerve plexuses and muscles of the bowel. We may expect such patients to recover, however, without medicinal treatment if we employ stomach lavage and use saline solution in the colon as recommended by Murphy, or an occasional large enema as the conditions indicate. Wathen gives directions for intestinal anastomosis when indicated, recommending that it be done quickly in the lateral way, though in many cases an end-to-end union is advisable. He especially advises against too much handling of the gut; drainage should be avoided if possible, and when necessary a rubber perforated or split tube should be used. Glass tubes often cause bad postoperative results, and gauze ceases to drain after a few hours and becomes then positively harmful. He mentions two recent personal cases of stomach perforation, in one of which the tube alone was used and in the other drainage by tube and gauze. The first patient made an uninterrupted recovery, though the operation was performed twenty-four hours after the perforation occurred, while the other went through a trying period of suppuration, fever, etc., which might have been avoided without the gauze.

BOOKS

REVIEWED

Injuries and Diseases of the Knee-Joint. By Sir William Bennett, K.C., V.O., F.R.C.S., is a small volume of 236 pages, which has for its basis the extensive personal experience of the author. The work, therefore, is in the first place not stereotyped nor a remodelling of the facts taught generally in texts on surgery, and in journal articles. It may be said truthfully that Injuries and Diseases of the Knee-Joint is a commentary on the prior teachings on the subject at the hands of a man whose experience was broad enough to put the whole of this teaching to the test, and whose judgment was sound enough to enable him to pass correctly on the validity of that teaching.

There are many phases of the subject, which the author has purposely omitted, and certain others are only alluded to—phases which do not concern the average practicing physician, and rarely the busy surgeon. The things met in practice and met often are what the author covers so well. The knee has become more or less a bugaboo, and justly so, for too many crippled lower extremities attest the fact that either disease of it is bad or the treatment incorrect. Bennett inclines to the latter view, and thinks that the diagnosis of knee lesions can be made only with the greatest care.

The text is written in attractive style; there is no ambiguity, and illustrative cases are interspersed throughout the volume to make clear the point in hand. Reviewing the book has been a delight, and it cannot fail to make a great improvement in our results if generally read and followed. It is not only a book for the surgeon, but gives to the physician the most rational conception of the subject he can find.

More than thirty plates and figures are distributed throughout, but it is to the text attention is especially directed. It is full of useful facts gleaned from a large experience.

W. A. B.

The Urine, Clinical Chemistry of Gastric Contents, the common Poisons and Milk, by J. W. Holland, M.D., Professor of Chemistry, Jefferson Medical College; published by P. Blakiston's Son & Co., Philadelphia. Price, $1.00, in its eighth edition still remains a standard guide upon these subjects. It is brief, yet complete enough for clinical work, and is very accessible. However, some additions to clinical methods are omitted, as the dimethyl-amido-azo-benzol paper for testing hydrochloric acid of stomach contents. A short, but accurate method for getting the quantity of uric acid, and also Gunzburg's method for getting quantity of hydrochloric acid in gastric contents are not presented. Brief, accurate methods are needed by the clinician, and when one is worked up it should come out in the newer editions of texts. Notwithstanding these omissions, the book is to be highly recommended. J. M. K.

ELECTRO-THERAPY

Many a physician has had the subject of electro-therapy broached to him. He has been told that it is valuable, but how to apply it, well, that is another story which the salesman or manufacturer is unconcerned about. Now it stands to reason that, no matter how interesting the modality may be, if we do not know how and when to apply it, it will not be of interest to the profession. Another reason why many physicians have refrained from interesting themselves in the subject is, that manufacturers have made the apparatus unnecessarily complicated. A wall plate equipped with the necessary apparatus for obtaining the galvanic and faradic current, and the cost of which does not exceed fifty dollars, including the necessary electrodes, will do as good work as the apparatus costing twice or three times as much, and be far less confusing. A Carpentier-Deprez milliammeter, with double scale for both fine and coarse reading and a Gaiffe rheostat which is wear proof, and can be regulated to a quarter milliampere, is all that is required for the administration of galvanic currents. This temperature co-efficient of the rheostat being nill the applied voltage cannot change and the readings obtained on the milliammeter will be constant.

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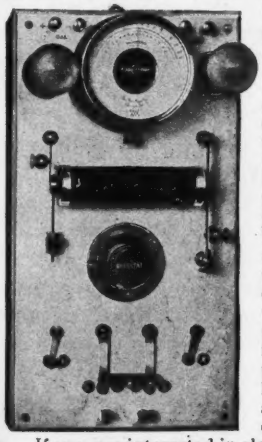

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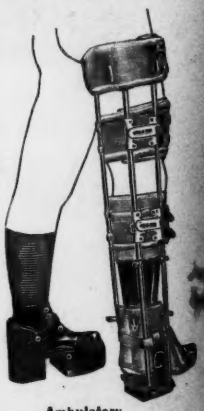

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